WILDLIFE REVIEW

AN ABSTRACTING SERVICE FOR WILDLIFE MANAGEMENT
ISSUED FOR THE INFORMATION OF COOPERATORS
BY THE FISH AND WILDLIFE SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

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WILSON ORNITHOLOGICAL CLUB

Alaska Game Commission: Annual Report, 1941

Anon. The second annual report of the Alaska Game Commission to the Secretary of the Interior for the period July 1, 1940 to June 30, 1941, 22 pp. (chiefly tables), mimeographed, 1 pl.

Sections of a type usually abstracted for WILDLIFE REVIEW include reports on the status of game species. Among these, those on transplanted animals are of special interest. Growth in herds has been: Bison, 23 to 300 since 1928; Olympic elk, 8 to 200 since 1927; and muskoxen, 34 to 100 in 6 years. Mongolian and ring-necked pheasants are reported doing well and Reeves and Nepal Kaleege pheasants showing promise. The largest section of the document is devoted to fur animals. It records the number and value of furs of 20 species shipped from Alaska since 1925. Aggregate value more than 40 million dollars.

Bibliography: Fur animals

Yeager, Lee E. A contribution toward a bibliography on North American fur animals, Illinois Natural History Survey (Urbana) Biological Notes, 10, 209 pp. (mimeographed), Dec. 1941.

Titles are grouped under the following main heads: Historical, conservation, management, farming, utilization and technology, and species. There is a short supplement; 2 figures illustrating the relative abundance and character of literature pertaining to the principal groups of animals, and the increase in scientific papers on fur animals by 10-year periods, 1830-1940; and a list of the periodicals cited, each name being given in brief and in full. Bibliographies are tools necessary to satisfactory work in science and Dr. Yeager is to be congratulated for making this extensive compilation publicly available.

Bibliography: Mammals of Utah

Hayward, C. Lynn. A bibliography of Utah mammalogy; including references to names and type localities (First supplement), Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 2(4), Dec. 1941, pp. 125-136.

Cited to call attention to its predecessor (Proc. Utah Acad. Science, Arts, and Letters, 13, 1936, pp. 121-146), in conjunction with which it is a thorough guide to literature on the mammals of Utah.

Classification: Amphibia, Scaphiopus

Tanner, Vasco M. A study of the genus Scaphiopus, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 1(1), July 1939, pp. 3-20, 3 pls.

Key to 2 subgenera and to 3 species in each; synonymy, measurements, and distribution; bibliography of 12 titles. Photographs of specimens of 3

species; drawings of skulls and cutting spades of 6; and map outlining the ranges of all forms.

Classification: Animals

Driver, Ernest C. Name that animal, 527 pp., illus. (Obtainable from the author, 119 Prospect St., Northampton, Mass. $5.00 a copy, cloth bound). 1942.

Consists essentially of illustrated keys to land and fresh-water animals. The scope of the treatment varies greatly for the phyla, being almost complete for some, including only selected species in others, and extending no further than families of birds or even orders of insects. Introductory matter in the chapters on phyla includes remarks on biology and instructions for collecting. Special sections are devoted to eggs and tracks. There is a bibliography of general references and a list of special titles accompanying each chapter.

Classification: Cestoda, Hymenolepis

Hughes, R. Chester. A key to the species of tapeworms in Hymenolepis, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(3), July 1941, pp. 378-414, 5 figs.

Notes on the characters of these bird and mammal parasites and illustrated key to numerous species.

Classification: Mammalia, Microdipodops

Hall, E. Raymond. Revision of the rodent genus Microdipodops, Papers on mammalogy published in honor of Wilfred Hudson Osgood. Field Museum of Natural History (Chicago, Ill.), 1941, pp. 233-277, figs. 46-53.

Systematic account of 16 subspecies arranged under 2 species. The general distribution of the mice, their differentiation, and habits are discussed. The characters of the genus are set forth, the species described and commented upon as wholes, and each subspecies technically treated under the heads: type, range, diagnosis, comparisons, and remarks. Localities for the specimens examined are listed.

Classification: Spermatophyta, Cicuta

Mathias, Mildred E., and Lincoln Constance. A synopsis of the American species of Cicuta, Madrono (Lancaster, Pa. 75 cents a copy), 6(5), Jan. 1942, pp. 145-151.

Key to, and brief description of, 7 species of water hemlocks, the roots of which are poisonous, but the seeds of which are used to some extent by wildlife. The synonymy swallows up twenty names proposed by more enthusiastic authors. Type localities are recorded, distributions outlined, and representative collections cited.

Conservation

Anon. "America, my country," National Audubon Society (1006 Fifth Ave., New York, N. Y.), 48 pp., 1 col. pl., 9 halftones. 1942.

Account (embracing numerous quotations) of the natural wealth of the United States, its exploitation, and growth of the conservation movement. "Men will die gladly for their country and there devolves upon us a singular obligation to preserve a country worth dying for" (Newton B. Drury). The work and objectives of the Audubon Society are described and an appeal made for support.

Conservation: Raptors

Stuart, Russell. Indiscriminate killing of beneficial hawks and owls must cease, North Dakota Outdoors (State Fish and Game Dept., Bismarck, N. Dak.), 4(8), Feb. 1942, pp. 10-11, 3 photos.

"Indiscriminate shooting of hawks and owls during the last upland game season by uninformed sportsmen would seem to be a greater crime than the shooting of one or two pheasants over the bag limit. It seems that many hunters and others took special delight in shooting a hawk that happens to be our most beneficial species--namely, Swainson's Hawk." Fifty-seven victims were counted within recognition distance along a six-mile stretch of road. Forty-one dead and two crippled were found under the trees of a small grove. "Such incidents x x x should never reoccur in North Dakota."

Notes and references on the value of raptors are given and the legal status of both hawks and owls in the State is outlined. Companion articles are "Hawks" by E. M. Lee (p. 11) and "Hawks and owls that may be seen in North Dakota" by Roy N. Bach (pp. 12-13, 2 charts). The first urges protection of beneficial and harmless hawks and compliance with the law from a warden's point of view, and the second lists the forms of hawks and owls and tabulates their status in North Dakota as to breeding, seasonal occurrence, abundance, utility, and legal protection.

Conservation: Turkey

Latham, Roger M. The history of the wild turkey in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 12(9), Dec. 1941, pp. 6-7, 32, 2 photos.

Statement of decline of the species in the East under persecution and of efforts to conserve it in Pennsylvania beginning in 1838. Laws benefiting the species are reviewed; by 1910 they were bringing gratifying results. Other steps to aid the birds are noted. The three most effective of all were: rigid law enforcement, maintenance of numerous small special refuges, and the planting of first quality stock.

Conservation: Whales

Orr, Robert T. The distribution of the more important marine mammals of the Pacific Ocean, as it affects their conservation, Proc. Sixth Pacific Science Congress (University of California Press, Berkeley), 3, 1940, pp. 217-222.

Nine species of whales are, or have been, of commercial importance in the Pacific Ocean. Their distribution and status in relation to whaling are discussed. Exploitation of whales and steps that have been taken toward their conservation are outlined.

Control: Defensive

Allan, Philip F. Defensive control of rodents and rabbits, Journ. Wildlife Management (Logan J. Bonnett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 122-132.

Author's abstract: "The methods of defensive control are classified as: (1) Physical, including destruction of habitat and creation of non-living barriers; (2) biological, including natural enemies and diseases, changing flora and fauna, creation of living barriers, diversion to other habitats, control in the creation of new environments; and (3) chemical, as chemical barriers and repellents. Defensive methods for the control of rodents are those designed to bring about a change of natural conditions of a permanent or semi-permanent kind unfavorable to the species. Such changes may be physical, biological, or chemical. Some defensive measures are of proved value--namely, tillage practices; grazing of cover crops; destruction of cover by fire; flooding; fencing; encouragement of natural enemies; changing flora by use of fire; changing flora by use of grazing; diversion to habitats immune from injury; and the use of chemical repellents. Most of the defensive measures discussed are of suggestive value only; more research and trials are needed. A list of 42 references on the subject is given."

Control: Hazards of, effects of fish poison on other organisms

Vestal, Elden H. Rough fish control in Gull Lake, Mono County, California, California Fish and Game (Terminal Id., Calif.), 28(1), Jan. 1942, pp. 34-61, figs. 11-21, tables.

Of interest to terrestrial wildlife managers are reports on "experiments on higher vertebrates" (p. 41). A garter snake immersed in a derris solution for hours, "seemed not the slightest affected." Solutions were force-fed to a Brewer's blackbird, two sagebrush chipmunks, a golden-mantled ground squirrel, and a domestic sheep without ill effects. Submerged water plants also were not visibly damaged by prolonged soaking in derris and water.

Control: Hazards of, electric fence

Whitaker, H. E., and R. B. Shepard. Report on electric shock as it pertains to the electric fence, Underwriters Laboratories Inc. (Chicago, Ill.), Subject 855, 56 pp., 5 figs., 26 tables, 1939.

Report on experiments and inquiries, and on the record (34 titles cited), with conclusions and recommendations. This publication should be studied and all of its implications considered by those planning to install electric fences. They may be dangerous and have caused fatalities, but can be safeguarded.

Control: Hazards of, susceptibility of rabbits to strychnine poisoning

Cobb, Frank E. Rabbit poison harmless to upland game birds, North Dakota Outdoors (State Fish and Game Dept., Bismarck, N. Dak.), 4(8), Feb. 1942, pp. 14-15.

The bait, strychnine-treated ear corn, "is never placed without the consent of the farmer-owner of the shelterbelts." Experiments by the Fish and Wildlife Service show that pheasants and partridges in captivity are very reluctant to take poisoned grain, and that when force-fed, a cropful of the poisoned bait does not kill them. No dead birds were found where the shelterbelt protective work was carried on.

Control: Hazards of, susceptibility of sage grouse to strychnine poisoning

Ward, Justus C., Malcolm Martin, and Warren Allred. The susceptibility of sage grouse to strychnine, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 55-57, 4 tables.

Authors' abstract: "Captive birds did not accept strychnine-poisoned grain, but when fasted took small quantities of strychnine-poisoned alfalfa. The conclusions were drawn that there would be no danger to sage grouse from grain baits distributed for rodent control but that care should be exercised in using poisoned alfalfa in jackrabbit control. Pharmacological studies proved that birds force-fed poisoned grain could be killed with doses of 50 mg/kg or even less. Strychnine administered by stomach tube will kill at 50 and 100 mg/kg; birds survived 35 mg/kg and lower doses. By intraperitoneal injection 10 mg/kg killed while 5 mg/kg did not."

Control: Of gull, herring

Spear, Ivan M. Herring gull control experiments, Bowdoin Scientific Station (Bowdoin College, Brunswick, Maine), Bul. 8, April 1942, pp. 15-31, 1 pl., tables (mimeographed).

By destruction of eggs; to be fully effective this must be done by a method that will prevent recognition that the eggs are dead by the adults while still in their ovulating cycle and thus able to lay another clutch. Report is made upon the various practices and substances tried. Spraying the eggs with an oil containing substances to preserve and harden the eggs is most promising. Details of the experiments are stated and tabulated. Weights, measurements, and illustrations of embryos of different ages are given to facilitate estimates as to the stages of incubation.

Control: Of mice

Anon. Mice, Timely Turf Topics (U. S. Golf Assoc. Green Section, Box 73, Benjamin Franklin Station, Washington, D. C.), Nov. 1941, p. 2 (mimeographed).

Suggestions as to use of traps and poisons with particular reference to golf courses.

Control: Of moles

Silver, James, and A. W. Moore. Mole control, U. S. Dept. of the Interior, Conservation Bul. 16 (Supt. of Documents, Washington, D. C. 10 cents a copy), 17 pp., 14 figs., 1941.

Revision of Farmers' Bul. 1716. Main headings: Where moles are found, description, habits, economic status, trespassers in mole runways, natural enemies and other checks, control methods (chiefly trapping), and utilizing mole skins.

Control: Of pocket gophers

Crouch, W. E. Pocket gopher control, U. S. Dept. of the Interior, Conservation Bul. 23 (Supt. of Documents, Washington, D. C. 10 cents a copy), 20 pp., 17 figs., 1942.

Life history and economic status; methods of control; community efforts. Supersedes U.S.D.A. Farmers' Bulletin 1709.

Control: Of rabbits

Garlough, F. E., J. F. Welch, and H. J. Spencer. Rabbits in relation to crops, U. S. Dept. of the Interior, Conservation Bul. 11 (Supt. of Documents, Washington, D. C. 10 cents a copy), 20 pp., 12 figs., 1942.

The habits of 4 groups of rabbits are discussed, and the legal status of the animals briefly outlined Repression is often needed and the means discussed are hunting, trapping, and poisoning. Possibilities in the utilization of rabbit carcasses are pointed out. Defensive measures, including fencing, and using repellents also are considered.

Control: Of rats

Silver, James, W. E. Crouch, and M. C. Betts. Rat proofing buildings and premises, U. S. Dept. of the Interior, Conservation Bul. 19 (Supt. of Documents, Washington, D. C. 10 cents a copy), 26 pp., 23 figs., 1942.

General principles of rat proofing and their application to farm and city buildings; suggestions as to rat-proofing ordinances and organized control campaigns. Supersedes U.S.D.A. Farmers' Bulletin 1638.

Control: Of starling

Lovell, Harvey B. A successful method of preventing starling roosts, Wilson Bul. (Josselyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 53(4), Dec. 1941, pp. 237-238.

Noise-producer consisting of upward-opening pipes, terminating in 18-inch pieces of soft rubber hose; compressed air straightens out the hose and causes a sharp report; the hose falls back, obstructs the air, and the process is repeated. Success reported with 6 installations in Louisville, Ky.

Cycles: Arctic animals

Chitty, Dennis, and Helen Chitty. Canadian Arctic wild life enquiry, 1939-40, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, England. 20 shillings a copy), 10(2), Nov. 1941, pp. 184-203, 1 pl., 5 figs., tables.

Fifth annual summary of information about fluctuations in populations of lemmings, arctic fox, and snowy owl, and on the prevalence of disease among sledge dogs. In each year there has been a peak in lemming populations somewhere. Arctic fox and snowy owl numbers have in many areas shown a rise and fall correlated with the lemming cycle, but the data are not sufficiently precise to establish the interrelations in detail.

Cycles: Grouse, Ruffed

Miller, J. Paul. Cycles again?, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 12(10), Jan. 1942, pp. 4-5, 4 figs.

Popular type discussion pointing out that with the high rate of infant mortality and other hazards, if grouse had 2 unproductive breeding seasons in succession, their populations would be greatly reduced as at the low of a supposed cycle. Abundance and scarcity prevailing simultaneously in nearby territories also does not seem explainable on the cyclic theory. What are taken for cycles in the ruffed grouse may be results due to a combination of ordinary circumstances.

Cycles: Hare, Snowshoe

Chitty, Dennis, and Helen Chitty. The snowshoe rabbit enquiry, 1939-40, Canadian Field-Naturalist (C. H. D. Clarke, National Parks Bureau, Ottawa, Canada. 25 cents a copy), 56(2), Feb. 1942, pp. 17-21, 1 fig., 2 tables.

Reports from correspondents briefed by Provinces in text, tables, and figures. Authors' summary: "551 observers in Canada, U.S.A. and Alaska reported about changes in the numbers of snowshoe rabbits in 1939-40 compared with the previous 12 months. Recovery from the bottom of the latest ten-year cycle was proceeding rather slowly in most areas but in others rabbits had already become noticeably abundant."

Destruction: Otter, Sea

Fisher, Edna M. The sea otter, past and present, Proc. Sixth Pacific Science Congress (University of California Press, Berkeley), 3, 1940, pp. 223-236, 1 table.

Brief statement of the natural history and distribution of the species. Full discussion of pursuit and use of sea otters by racial groups: the Japanese, Russians, English, French, Spanish, and Americans. The table is a partial list of the animals taken from 1727 to 1938. The animal now enjoys a considerable degree of protection. Bibliography of 2-1/2 pages.

Diseases and Parasites

Cameron, A. E. Public health, Canadian Journ. Comparative Medicine and Vet. Science (National Business Publications Ltd., Gardendale, Quebec, Canada), 5(4), April 1941, pp. 95-105.

Brief discussion of a number of diseases, wildlife relationships being noted for equine encephalomyelitis, psittacosis, tularemia, and two skin diseases.

Diseases and Parasites: Coccidioidomycosis

Emmons, C. W. Isolation of coccidioides from soil and rodents, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(4), Jan. 23, 1942, pp. 109-111.

Coccidioidomycosis representing infection by the fungus Coccidioides immitis is a human disease. Search for animal reservoirs in the vicinity of San Carlos, Arizona, revealed the fungi in 6 species of rodents. In Perognathus, the incidence of infection was 80 percent. Bibliography of 6 titles.

Diseases and Parasites: Encephalomyelitis

Gwatkin, Ronald. Further examination of small mammals and birds in a search for carriers of equine encephalomyelitis virus, Canadian Journ. Comparative Medicine and Vet. Science (National Business Publications Ltd., Gardendale, Quebec, Canada), 5(4), April 1941, pp. 113-116.

Investigations in British Columbia involving 5 species of mammals, 8 of birds, and one of ticks. Author's summary: "During May and June 1940, examination was made of 69 lots of brains, spleens and ticks for the presence of equine encephalomyelitis virus. These lots consisted of 200 brains of ground squirrels, mice and other small mammals and birds, 34 ground squirrel spleens and 527 ticks (D.[ermacentor] andersoni). One lot of ground squirrel spleens and one lot of mouse brains gave rise to thermal reactions in the inoculated guinea pigs but no virus was demonstrated. All animals that survived were subjected to a challenge inoculation of western virus and all succumbed. There was no evidence of the presence of the virus in any of the material examined."

Diseases and Parasites: Encephalomyelitis

Mitchell, Chas. A., and R. V. L. Walker. Studies in equine encephalomyelitis, Canadian Journ. Comparative Medicine (National Business Publications Ltd., Gardendale, Quebec, Canada), 5(11), Nov. 1941, pp. 314-319, 2 figs., 2 tables.

Experimentally, hamsters and chipmunks were found susceptible, and foxes and rabbits refractory, to the disease. Groundhogs and various birds were susceptible when young. No wild animal or bird studied became host to the virus.

Diseases and Parasites: Paratyphoid

Levine, Norman D., and Robert Graham. Paratyphoid in baby wood ducks, Journ. Amer. Veterinary Medical Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 100(780), March 1942, pp. 240-241.

Locality, northern Illinois; symptoms, lesions, and experimental work are described; references to 6 cognate publications are given. From authors' summary: An outbreak of paratyphoid associated with Salmonella typhimurium which caused the death of 400 out of 500 week-old wood ducks (Aix sponsa) is described. The organism was isolated from a healthy adult mallard on the premises, and it is possible that the infection may have followed contamination by adult carriers.

Diseases and Parasites: Rabies

Tice, F. J., and W. M. Evans. Rabies in a wild fox, Cornell Veterinarian (A. G. Danks, Ithaca, N. Y. 50 cents a copy), 32(1), Jan. 1942, pp. 98-99.

From New York; symptoms; diagnosis.

Diseases and Parasites: Trypanosomiasis

Wood, Sherwin F. Notes on the distribution and habits of reduviid vectors of Chagas' disease in the southwestern United States, Pan-Pacific Entomologist (California Academy of Sciences, San Francisco. 75 cents a copy), 17(2), April 1941, pp. 85-94; 17(3), July 1941, pp. 115-118.

Review of literature, of which 7 titles are cited. The carriers are bugs of the genus Triatoma and the reservoirs are various forms of wood rats (Neotoma) for which scientific names and places of collection are recorded. Description of the habitat of the bugs involves detailed discussion of the nests of wood rats.

Diseases and Parasites: Tuberculosis

Hadwen, Seymour. Tuberculosis in the buffalo, Journ. Amer. Veterinary Medical Assoc. (600 S. Michigan Ave., Chicago, Ill. 75 cents a copy), 100(778), Jan. 1942, pp. 19-22, 3 photos, 1 table.

Prevalence of this disease in the Wainwright herd based on autopsies of 12,000 animals killed from 1923 to 1939; figures are given also for 1,678 elk, moose, and deer. Percentages of bisons with lesions varied from 76 in the first, to 30 in the last, year. Probabilities as to the source of infection and spread among the buffalos and other animals are discussed.

Diseases and Parasites: Tularemia

Green, Robert G. Tularemia as a hunter's problem, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 3(17), Feb. 1942, pp. 41-45.

"Tularemia occurs as a natural infection in rabbits, grouse, squirrels, gophers, mice, and a variety of other small animals. The ring-necked pheasant and the dog are two animals that appear almost entirely immune. x x x Cottontail rabbits are very susceptible and always die; snowshoe hares are comparatively resistant and usually recover." The role of ticks in spreading the disease among wild mammals and birds is fully discussed. Symptoms of the disease in humans are described and precautions to avoid it are recommended. Chief of these is handling rabbits only during cold weather.

Diseases and Parasites: Blood parasites

Johnus, J. Frederick, and Dwight L. Ryerson. Hematozoa from California birds, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 27(6), Dec. 1941, pp. 540-541.

Host records for Haemoproteus, Plasmodium, Leucocytozoon, trypanosomes, and microfilariae.

Diseases and Parasites: Helminths

Chandler, Asa C. Helminths of tree squirrels in southeast Texas, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(2), April 1942, pp. 135-140, 3 figs., 1 table.

Author's summary: "Thirteen fox squirrels and four gray squirrels from East Texas harbored the following helminths: Raillietina (R.) bakeri, n. sp., in a majority of the adult animals; Cysticercus tenuicollis, one specimen; Strongyloides robustus, n. sp., in all adult animals; Heligmodendrium hassalli, in all animals, even those not full grown; and two kinds of microfilariae, each occurring once." The latter are also provisionally described as new species. Descriptions and measurements are given for the others and figures for the first-named. Bibliography of 7 titles.

Diseases and Parasites: Lungworms

Goble, Frans C., and Arthur H. Cook. Some lungworm records from foxes in New York, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 22(4), Nov. 1941, p. 456.

Eucoleus aerophilus in red, and Crenosoma vulpis in both red and gray, foxes.

Diseases and Parasites: Acanthocephala, Moniliformis

Peery, Harold J. A case of peritoneal moniliformiasis in a fox squirrel, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(3), July 1941, pp. 375-377, 1 pl.

Oklahoma; description, illustration, regarded as nearest M. clarki Ward.

Diseases and Parasites: Acarina, Ixodes

Gregson, J. D. The coast tick (Ixodes californicus Banks) problem in British Columbia, Canadian Entomologist (R. H. Ozburn, Ontario Agricultural College, Guelph, Ont., Canada), 74(1), Jan. 1942, pp. 3-5.

This species, ranging from California to British Columbia, has increased notably in the latter area and is a pest of some consequence to man and domestic animals. The larval and nymphal instars are passed chiefly on lizards. Rarely they have been found on squirrels, white-footed mice, and grouse. The coast tick is not known to be involved in the transmission of any disease in British Columbia but has been recorded as a carrier of tularemia in Oregon.

Diseases and Parasites: Cestoda, Anonchotaenia

Rodgers, L. Ormand. A new dilepidid tapeworm from a cardinal, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(2), April 1941, pp. 273-275, 1 pl.

Anonchotaenia rostellata; Oklahoma; list of 13 species of the genus; comparative notes.

Diseases and Parasites: Cestoda, Dilepis

Polk, Seigul J. Dilepis hilli, a new dilepidid cestode from a little blue heron, Jasmann Collector (Edward L. Kessel, University of San Francisco, San Francisco, Calif.), 4(4), Nov. 1941, pp. 131-134, 1 pl.

Description, illustrations, comparative notes (with 9 other species of the genus); Oklahoma.

Diseases and Parasites: Cestoda, Hymenolepis

Brock, Mason E. Hymenolepis stolli, a new hymenolepidid cestode from the pintail duck, Jasmann Collector (Edward L. Kessel, University of San Francisco, San Francisco, Calif.), 4(4), Nov. 1941, pp. 135-138, 1 pl.

Description, illustrations, comparative notes; Oklahoma. Bibliography of 10 titles.

Diseases and Parasites: Cestoda, Hymenolepis

Polk, Seigul J. Hymenolepis mastigopraedita, a new cestode from a pintail duck, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(2), April 1942, pp. 141-145, 1 pl.

Collected in Oklahoma; description, measurements, illustrations; notes on diagnostic characters of 11 species of the genus. Bibliography of 12 titles.

Diseases and Parasites: Diptera, Cuterebra

Dalmat, Herbert T. A new Cuterebra (Diptera; Cuterebridae) from Iowa with notes on certain facial structures, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(2), March 1942, pp. 418-421, 3 figs.

C. angustifrons from Peromyscus leucopus noveboracensis, description, illustration, comparative notes.

Diseases and Parasites: Diptera, Cuterebra

Scott, Thos. G., and Edwin Snead. Warbles in Peromyscus leucopus noveboracensis, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(1), Feb. 1942, pp. 94-95.

Percentage of trapped animals found infested in July, August, September, and October, of two years, near Boone, Iowa. The incidence of infestation was greatest in September during which month there was a downward trend in the mouse population. The warbles (one of which was identified as Cuterebra fontinella) may have contributed to this mortality.

Diseases and Parasites: Nematoda

Chitwood, B. G., and M. B. Chitwood. An introduction to nematology. Section I, Part 1, pp. 1-53, Figs. 1-53, 1937; Section I, Part 2, pp. 55-123, Figs. 54-111, 1938; Section I, Part 3, and Section II, Part 1, pp. 125-241, Figs. 112-164, 1940 (Babylon, N. Y. $2.50, $3.00, and $4.50 a copy, respectively)

Called an introduction, this work if continued as begun will be a great monograph of nematodes. The history of nematology, the general structure of the worms, the external cuticle and hypodermis, the somatic musculature and organs of the body cavity, outline of classification, cephalic structure, and stoma, esophagus, intestine (mesenteron), posterior gut (proctodeum), excretory, reproductive, and nervous systems, ova, relationships, gametogenesis, embryology, and postembryonic development are chapter headings. Each section includes ample illustration and bibliography. Some of the chapters already issued and others announced are by authors other than the publishers.

Diseases and Parasites: Nematoda

Reiber, Robert J., and Elon E. Byrd. Some nematodes from mammals of Reelfoot Lake in Tennessee, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 78-89, 4 pls.

Ten species of nematodes were found in the digestive tracts (stomachs excluded) of 28 out of 36 hosts of 7 species. They are figured, described, and mostly otherwise commented upon. Bibliography of 13 titles.

Diseases and Parasites: Nematoda, Contracaecum

Lucker, John T. A redescription of Contracaecum multipapillatum (Von Drascho, 1882) (Nematoda: Anisakinae), Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 27(6), Dec. 1941, pp. 505-512, 1 pl., 1 table.

Review of the literature (12 titles cited); description, illustrations, and measurements of the species named; hosts waterbirds of the genera Mycteria, Anhinga, and Ardea; the new name C. ainterlabium is proposed for C. multipapillosa Skrjabin (from Ardea sp.) having the status of a rejected synonym.

Diseases and Parasites: Nematoda, Nematodirus

Tucker, Hal. Nematodirus tortuosus n. sp. (Nematoda) from the rat, Neotoma, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(2), April 1942, pp. 159-163, 2 pls.

Collected in California; description, measurements, illustrations, comparative notes.

Diseases and Parasites: Nematoda, Physaloptera

Hill, Wm. C. Physaloptera terrapenis, a new nematode from a tortoise, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(1), Jan. 1941, pp. 59-64, 1 pl.

From Terrapene spp., Oklahoma; description, illustration; comparative notes on 20 other species of the genus. Bibliography of 13 titles.

Diseases and Parasites: Nematoda, Spironoura

Walton, A. C. Notes on some helminths from California Amphibia, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kansas), 60(1), Jan. 1941, pp. 53-57, 1 fig.

Records of 4 species, one (Spironoura ranae) from Rana boylii described as new; list of species assigned to this genus and key to males of 10 of them. Bibliography of 32 titles.

Diseases and Parasites: Nematoda, Stunkardionema

Arnold, John G., Jr. A new rabbit nematode, Stunkardionema halla, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kansas), 60(1), Jan. 1941, pp. 65-68, 1 pl.

New genus and species; from cottontails, Kansas and New York.

Diseases and Parasites: Protozoa, Cepedietta

Kay, Maire W. A new astomatous ciliate from the newt, Eurycea bislineata (Green), American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(2), March 1942, pp. 422-427, 3 figs.

Cepedietta fibrillata n. gen. et sp., Massachusetts; description, illustrations, discussion of systematic position. Bibliography of 8 titles.

Diseases and Parasites: Protozoa, Eimeria

Huizinga, Henry. Eimeria antelocaprae, a new coccidium from the American antelope, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(2), April 1942, pp. 167-168, 2 figs., 1 table.

Collected in Wyoming; description, measurements, illustrations. The generic name of the antelope, and consequently the specific name of the parasite derived therefrom are misspelled. They should be Antilocapra and antilocaprae, respectively.

Diseases and Parasites: Trematoda

Byrd, Elon E. Mammalian trematodes. III. Certain species from bats, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 149-156, 1 pl., 1 fig.

Descriptions and illustrations of, and remarks upon, 6 species of digenetic trematodes of which the following are proposed as new: Prosthodendrium transversum from Lasiurus borealis (Tennessee), and P. singularum from Dasypterus floridanus (Mississippi). Bibliography of 7 titles.

Diseases and Parasites: Trematoda

Byrd, Elon E., and Robert J. Reiber. Mammalian trematodes. I. Trematodes from the opossum, Didelphis virginiana Kerr, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 130-142, 4 pls.

Descriptions and illustrations of 8 species. Bibliography of 10 titles.

Diseases and Parasites: Trematoda

Byrd, Elon E., and Robert J. Reiber. Mammalian trematodes. II. Three flukes from small mammals, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 143-148, 1 pl.

Descriptions, illustrations, remarks. Bibliography of 8 titles.

Diseases and Parasites: Trematoda

Hughes, R. Chester, Joe W. Higginbotham, and Jasper W. Clary. The trematodes of reptiles, Part 1, Systematic section, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(1), Jan. 1942, pp. 109-134.

Systematic list of reptilian flukes, with synonymy and host records.

Diseases and Parasites: Trematoda, Apatemon

Stunkard, Horace W., Charles H. Willey, and Yale Rabinowitz. Cercaria burti Miller, 1933, a larval stage of Apatemon gracilis (Rudolphi, 1819) Szidat, 1928, Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(4), Oct. 1941, pp. 485-497, 2 pls.

Characters and life history of this parasite of Anseriformes; C. pseudoburti Rankn also considered synonymous. Bibliography of 15 titles.

Diseases and Parasites: Trematoda, Cryptocotyle

Hoff, C. Clayton. A case of correlation between infection of snail hosts with Cryptocotyle lingua and the habits of gulls, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 27(6), Dec. 1941, p. 539.

Littorina litorea were infested by this trematode in proportion to the degree of use of their habitat by herring gulls--a common host. Maine, New Hampshire.

Diseases and Parasites: Trematoda, Paragonimus

Byrd, Elon E., Robert J. Reiber, and Malcolm V. Parker. The anatomy of a lung fluke from the opossum (Didelphis virginiana Kerr), Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 115-129, 2 pls.

P. westermani: description, measurements, illustrations; discussion of specific characters in the genus. Bibliography of 20 titles.

Diseases and Parasites: Trematoda, Pharyngostomoides

Harkema, Reinard. Pharyngostomoides procyonis n.g., n. sp. (Strigeida), a trematode from the raccoon in North Carolina and Texas, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(2), April 1942, pp. 117-122, 2 pls.

Description, measurements, illustrations, comparative notes. Bibliography of 6 titles.

Diseases and Parasites: Trematoda, Proterodiplostomidae

Byrd, Elon E., and Robert J. Reiber. Strigeid trematodes of the alligator, with remarks on the prostate gland and terminal portions of the genital ducts, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(1), Feb. 1942, pp. 51-73, 5 pls.

The following described and illustrated as new: Pseudonecdiplostorum acetabulata, Florida; Pseudocrocodilicola americanianense n.g. et sp., and P. georgiana, Georgia. The characters of the family are discussed. Bibliography of 15 titles.

Diseases and Parasites: Trematoda, Schizostomatidae

Brackett, Sterling. Five new species of avian schizostomes from Wisconsin and Michigan with the life cycle of Gigantobilharzia gyrauli (Brackett, 1940), Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 28(1), Feb. 1942, pp. 25-42, 2 pls., 1 table.

Pseudobilharziella vaubosensis from Nyroca collaris and Mareca americana; P. kogonsensis from Nyroca valisineria; P. horiconensis from Nyroca americana; and P. burnetti from Nyroca collaris, all collected in Wisconsin, described and illustrated as new. Key to the males of 8 species of this genus including the new species. Key to males of 5 species of Gigantobilharzia, one of which G. lawayi from two kinds of gulls, Michigan, is described and illustrated as new. G. gyrauli is redescribed and figured, its life cycle, distribution, and hosts discussed. Bibliography of 15 titles.

Diseases and Parasites: Trematoda, Urotrema

Fennor, Lawrence R. The status of Urotrema shillingori Price, 1931 (Trematoda: Urotrematidae), Trans. Amer. Microsc. Soc. (J. E. Ackert, State College, Manhattan, Kans.), 60(3), July 1941, pp. 359-364, 1 pl., 1 table.

Redescription, photograph, comparative measurements of specimens from different hosts (bats, muskrat); distribution; U. lasiuronsis Alicata and U. minuta Macy are regarded as synonyms. Bibliography of 6 titles.

Diseases and Parasites: Of birds

Worth, C. Brooke. What killed cock robin?, Audubon Magazine (1006 Fifth Ave., New York, N. Y. 35 cents a copy), 44(1), Jan.-Feb. 1942, pp. 41-47.

Popular article giving some attention to all of the principal types of bird diseases.

Diseases and Parasites: Of eelgrass

Renn, Charles E. Demonstration of Labyrinthula parasite in eelgrass from the coast of California, Science (Lancaster, Pa. 15 cents a copy), 85(2457), Jan. 30, 1942, p. 122.

Identification from one Upper, and one Lower, California localities, of a Labyrinthula, which "shows the same morphological features and peculiar distribution in recently invaded leaf tissue as in diseased leaves of Atlantic eelgrass."

Diseases and Parasites: Of frog, green

Hazard, F. O. The absence of opalinids from the adult green frog, Rana clamitans, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 27(6), Dec. 1941, pp. 513-516, 1 fig.

Diplodiscus, a trematode, preys upon opalinids, eradicating them from adult green frogs. Trichomonas and Opalina, both protozoans, occur in roughly inverse proportions in frogs and toads. "A carbohydrate diet increases the number of trichomonads and decreases the number of opalinids."

Diseases and Parasites: Of fur animals

Shillinger, J. E. Diseases of fur animals, U. S. Dept. of the Interior, Conservation Bulletin 20 (Supt. of Documents, Washington, D. C. 10 cents a copy), 23 pp., 7 figs. 1942.

Discusses sanitation, infectious diseases (5 leading), internal parasites (7 groups), external parasites (5 groups), nutritional disturbances, injuries, wounds, abscesses, and vices.

Diseases and Parasites: Of game birds, upland

Shillinger, J. E., and L. C. Morley. Diseases of upland game birds, U. S. Dept. of the Interior, Conservation Bulletin 21 (Supt. of Documents, Washington, D. C. 15 cents a copy), 32 pp., 8 figs. 1942.

Supersedes U. S. Dept. of Agriculture Farmers' Bulletin 1781. Treats losses among game birds from diseases both in the wild and on game farms; suggests methods of sanitation; and discusses the more prevalent bacterial, virus, and fungous diseases; internal and external parasites; nutritional deficiencies; and other pathological conditions. Manifestations, lesions, and treatments are described.

Diseases and Parasites: Of grouse, ruffed

Ishii, Nobutaro. New parasite records from the ruffed grouse, Journ. Parasitology (Lancaster, Pa. $1.50 a copy). 28(1), Feb. 1942, p. 92.

The trematodes, Lyperosomum monenteron and Echinoparyphium aconiatum, Minnesota.

Diseases and Parasites: Of raccoon

Ingram, Wm. M. The helminth fauna of a raccoon, Journ. Parasitology (Lancaster, Pa. $1.50 a copy), 27(6), Dec. 1941, pp. 539-540.

Numbers recovered and habitats of the nematode, Physaloptera maxillaris, and the cestode, Mesocestoides. New York.

Diseases and Parasites: Of woodchuck

Wallace, F. G. The stomach worm, Obeliscoides cuniculi, in the woodchuck, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, p. 92.

Minnesota, Missouri.

Ecology: Census methods, deer, mule

Wright, Edward, and Lloyd W. Swift. Migration census of mule deer in the White River region of northwestern Colorado, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 162-164, 1 fig., 1 table.

Authors' abstract: "A method of checking a deer population by counting tracks on the shoulders of a road that traverses a migration route. The road was divided into two-mile, numbered, sectors and two track counters were assigned to each. Counts were taken each morning after tracks made the previous day were obliterated by dragging the road with a brush drag pulled by a truck. Tracks in the opposite direction to the general migration trend were subtracted from the sector totals. Recording the track counts by days and sectors provided a means of determining the reasons for variations in the migration trend in response to weather, open areas, and areas with brush, or other shelter. This method was used to estimate the number of deer that migrate to the summer range on the White River National Forest in northwestern Colorado and was much more accurate than any other previously tried."

Ecology: Census methods, hare, snowshoe

Webb, William L. Notes on a method for censusing snowshoe hare populations, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College. Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 67-69, 1 fig., 1 table.

Author's abstract: "A proposed method for determining the population of Lepus americanus by a modification of King's 'strip' method. The area is gridded by census lines 1/4-mile apart. The flushing distance (distance from observer to the hare) and jumping angle (angle from census line to the hare) are determined in the field for every hare seen on the census line; and the

width of the strip is calculated from the average flushing distance and the average jumping angle: Population = $\frac{AZ}{2\ XY\ \sin D}$. A = total area in square yards; Z = number of hares seen; X = length of census line in yards; Y = average jumping distance in yards; sine D = natural sine of the average jumping angle. Results of five censuses on the same area in St. Louis County, Minnesota, show plausible results."

Ecology: Census methods, squirrel, fox

Hicks, Ellis A. Some major factors affecting the use of two inventory methods applicable to the western fox squirrel, Sciurus niger rufiventer (Geoffroy), Iowa State College (Ames), Journ. Sci. 16(2), Jan. 1942, pp. 299-305, 4 tables.

Study made in a 250-acre woodland in Story County, Iowa, over a period of 1-1/2 years. The two methods of counting were: "Linear," in which squirrels seen along a route of definite width and length were enumerated; and "spot," in which the animals seen on adjacent 20-acre tracts in 30 minutes were tallied. From author's summary: "Use of these methods was greatly influenced by a large number of factors, namely, temperature, degree of cloudiness, topography, vegetative distribution and association, precipitation, season of year, hour of daily observation. Yearly observations indicate that the temperature bracket 31° F. to 50° F. was most conducive to squirrel activity. Much more activity occurred on clear days than on cloudy days. Seasonal division of data indicated that the peak of activity occurred in fall. Activity during each of spring and summer was about half that of fall, while winter movement was slightly less than that in either spring or summer. The two methods of count substantiated each other in indicating the time of day during which squirrel activity was most pronounced. The peak of activity occurred from 8:00 A.M.-10:00 A.M. with a minor surge from 1:00 A.M.-2:00 P.M."

Ecology: Cover mapping

Webb, William L. A method for wildlife management mapping in forested areas, Journal Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 38-43, 2 pls., 1 table.

Author's abstract: "The mapping method described is based on the study of random samples of the environment. Data taken in the field include notes on the presence and relative density of each plant species within the area of the sample. These data may be summarized in the form of species-distribution maps that show the presence and abundance of important plants in graphic form. The preferred method of analyzing the data, however, is a numerical designation called the rating which expresses the distribution and abundance of each species. Careful and scientific analysis of the environment is necessary to scientific management of a wildlife population."

Ecology: History of Faville Grove, Wis., wildlife

Hawkins, Arthur S. A wildlife history of Faville Grove, Wisconsin, Trans. Wis. Acad. Sci., Arts, & Letters (Madison), 32, 1940, pp. 29-65, 2 maps, 8 tables.

Several reports on wildlife management studies at Faville Grove have been published; this paper provides them with a background of ecological history. The status of breeding game birds and the history of quail populations, 1838-1938, are recorded in tables. Similar data are presented for the prairie chicken, 1900-1939; Hungarian partridge, 1922-1933; and pheasant, 1929-1939. Stocking operations with the last-named species are tabulated. The histories of the more prominent forms in each vertebrate phylum are outlined, and a bibliography of 25 titles presented.

Ecology: Home ranges of small mammals

Blair, W. Frank. Some data on the home ranges and general life history of the short-tailed shrew, red-backed vole, and woodland jumping mouse in northern Michigan, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 25(3), May 1941, pp. 681-685, 1 table.

Methods of the study are described and the results briefly stated. From author's summary: "The few data available indicate that in such a situation the home range of the short-tailed shrew usually exceeds one acre. The home range of an adult male red-backed vole sometimes may comprise as much as 3.56 acres. The size of the range of the woodland jumping mouse is variable, but an adult male sometimes may range over as much as 8.96 acres, while an adult female may range over as much as 6.55 acres. In all three species, the ranges of both males and females overlapped the ranges of other individuals of both sexes."

Ecology: Mosquito control operations

Penfound, Wm. T. The relation of plants to malaria control, U. S. Public Health Reports (Supt. of Documents, Washington, D. C. 5 cents a copy), 57(8), Feb. 20, 1942, pp. 261-268.

This paper reports on a study for the Tennessee Valley Authority during the summer of 1937 to 1940, inclusive. It deals with preparation and maintenance of reservoirs from the mosquito-control point of view. Author's summary: "The main objective of the biological investigations has been to obtain mosquito control through proper reservoir preparations and adequate reservoir maintenance with constantly diminishing reliance on larvicides. In the field of reservoir preparation, it has been possible to delineate trees on the basis of their ability to withstand flooding and thus to remove the intolerant species before impoundment. The determination of the seasonal growth of coppice has enabled the personnel charged with reservoir clearance to set the time for rebrushing operations in order to prevent a mosquito hazard subsequent to closure of the dam. The technique of willow stump poisoning has been improved and less toxic arboricides have been tested. These, and other bio-

logical researches on reservoir preparation, have yielded significant dividends in lowered maintenance costs.

"The rigid control of obnoxious shoreline vegetation is almost synonymous with adequate reservoir maintenance. The fact that coppice does not grow from completely inundated stumps and grows slowly when a considerable portion of the stump is immersed has led to the practice of low cutting of stumps. Rebrushing has been shown to decrease the growth rate of coppice and heavy grazing has been observed to eliminate coppice completely. Herbaceous plants present a much more serious mosquito control problem. To date, the worst offenders have been delineated and are being subjected to detailed life history studies. The rates of colonization are also being determined, especially in relation to the fluctuation schedules being employed. At present the methods of plant control involve removal, recurrent cutting, and the application of herbicides. Of the three methods, recurrent cutting, has yielded the greatest returns but is applicable only to cow-lily and lotus. Of the liquid herbicides, sodium arsenite has proved most effective, but five other less toxic plant poisons have demonstrated considerable promise. Airplane application of powdered herbicides has proved successful in opening up vegetation for more effective antilarval measures and possibly may be utilized to reduce plant growth sufficiently to obviate the use of larvicides.

"On the basis of our experience, the following suggestions are offered. Complete clearing to the maximum summertime pool level and a thorough autumn clean-up just preceding wintertime impoundment is prerequisite to effective mosquito control during the first two or three seasons in the life of a reservoir. Fundamental to adequate reservoir maintenance is the delineation and investigation of the most important obnoxious plants. As soon as this is done an intensive campaign to prevent or to limit the colonization of certain critical species should be undertaken. It should be pointed out that early discovery, proper treatment, and continuing vigilance are all important in such a program and that the field personnel should be thoroughly schooled in the various aspects of the problem. If it is impractical to prevent colonization, as may be the case with native species of wide distribution, attenuation by herbicides should be employed."

Comment: The word "delineate" should be replaced in each instance by "identify" or "determine."

Ecology: Natural areas

Shelford, V. E. The nature sanctuary idea, Audubon Magazine (1006 Fifth Ave., New York, N. Y. 35 cents a copy), 43(6), Nov.-Dec. 1941, pp. 502-510, 3 photos, 2 figs.

Samples of important biotic communities should be preserved for research material and as checks on managed areas. They should be large enough to maintain their most widely ranging species in a natural state and if necessary to that end, should be surrounded by buffer zones to be kept in semi-natural condition. Policies as to the large ungulates and predatory animals are discussed. Buffering is advised for certain existing sanctuaries and the need for large grassland reservations is pointed out. Proposed international

parks are listed and the condition of natural areas in Mexico and Central America referred to. Bibliography of 12 titles.

Ecology: Nesting losses of birds

Kendeigh, S. Charles. Analysis of losses in the nesting of birds, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 19-26, 1 fig., 4 tables.

Author's abstract: "The outcome of 2,725 nesting attempts of 51 species of mostly forest-edge birds and the percentage of all eggs to develop into fledglings are reported. Species that nest in holes or other relatively inaccessible locations have the highest percentage of success. Nest failures in the house wren (Troglodytes aedon) are more frequent during the first, than during the second, breeding period. In all species the daily rate of nest failures decreases with the progress of the nesting cycle. In successful nests the percentage of eggs that hatch is significantly greater in most species than the percentage of young that leave the nest after hatching. The percentage of eggs in the house wren that are infertile or that become addled is low at medial monthly air temperatures of 58° to 70° F. but becomes appreciably greater at both higher and lower temperatures."

Ecology: Populations, small mammals

Blair, W. Frank. The small mammal population of a hardwood forest in northern Michigan, Contrib. Laboratory of Vertebrate Genetics (University of Michigan, Ann Arbor), 17, Nov. 1941, 10 pp., 3 tables.

Area and its ecological associations described and its forest composition tabulated. Methods of the study are noted and the age classes, residence, and populations of the small mammals discussed. Author's summary: "Three hundred and ninety-six small mammals comprising six species were trapped alive, marked, and released on an 18.18 acre plot in a hardwood forest in Alger County, Michigan, from August 23 to September 22, 1940. The number of unmarked woodland deer-mice and eastern chipmunks decreased markedly after about ten to eleven days of trapping, and it is believed that subsequent unmarked individuals became old enough to leave the nest or moved to the plot from contiguous areas. The resident deer-mouse population comprised 53.9 per cent mature and 46.1 per cent immature animals. Of the chipmunks, 55.5 per cent were mature, and 44.5 per cent were immature. Of the resident deer-mice, only 6.1 per cent appeared to be a year or more of age. The deer-mice, with 3.8 individuals per acre, had the greatest density of population, but the chipmunks were only slightly less numerous, with 3.3 per acre. The total population of all small mammal species averaged about 8.6 to the acre. There was a relatively high concentration of mature male and female deer-mice, chipmunks, and woodland jumping mice, with one or more individuals of each sex per average home range area. The greatest concentration was of mature male deer-mice, with 3.1 individuals per average home range area in the first period of trapping, and 3.6 in the second." Bibliography of 7 titles.

Ecology: Rainfall in relation to partridges and pheasants

Dale, Fred H. Influence of rainfall and soil on Hungarian partridges and pheasants in southeastern Michigan, Journal Wildlife Management (Logan J. Bennett, A-1 Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 17-18.

Author's abstract: "Hungarian partridges (Perdix perdix) increased on heavy-textured soils of southeastern Michigan from 1916 to 1936 when summer rainfall averaged 8.17 inches. During the same period pheasant (Phasianus colchicus) populations remained relatively low. From 1937 to 1940 when summer rainfall varied from 9.14 to 19.82 inches, Hungarian partridges decreased in numbers while pheasants became more abundant."

Ecology: Territory

Nice, Margaret M. The role of territory in bird life, American Midland Naturalist (Notre Dame, Indiana. $1.00 a copy), 26(3), Nov. 1941, pp. 441-487.

Historical sketch of territorial hypotheses and 16-page bibliography in which 3 titles are from the 17th century, 2 from the 18th, 6 from the 19th, and the remainder (376) from the 20th. Six types of territory are defined and the bases and functions of territory are discussed. A useful review of the subject and key to its literature.

Ecology: Of cottontail

Schwartz, Charles W. Home range of the cottontail in central Missouri, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor, $1.00 a copy), 22(4), Nov. 1941, pp. 386-392, 1 fig., 2 tables.

Description of trapping area and methods and discussion of results. Author's summary: "(1) In this study there was no constant relationship between the number of traps set and the number of rabbits caught per month; (2) there was no significant tendency of either sex to re-enter the traps repeatedly; (3) the average recorded home range of the adult male cottontails trapped was 1.4 acres, that of the adult females 1.2 acres; (4) no significant relationship was found between the number of times an animal was trapped and the size of its recorded home range; (5) no extensive shifts of population occurred during the 16-months' trapping period, although a few adult and young rabbits moved to new locations; (6) during the severe weather of January and February 1940, cottontails left the open area and entered the adjacent woodlands."

Ecology: Of mammals, small

Blair, W. Frank. Size of home range and notes on the life history of the woodland deer-mouse and eastern chipmunk in northern Michigan, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(1), Feb. 1942, pp. 27-36, 1 fig., 3 tables.

Methods of the study are described; the animals involved are Peromyscus m. gracilis and Tamias s. lysteri. Author's summary: "One hundred and fifty-one woodland deer-mice and 154 eastern chipmunks were trapped alive, marked, released, and retrapped on an 18.18 acre plot in the midst of an extensive virgin hardwood forest in Alger County, Michigan. During the field period, from August 25 to September 22, 1940, the size of the home ranges of adult male deer-mice averaged 2.31 ± .27 acres; of adult females, 1.39 ± .16 acres; of immature females, 1.07 ± .17 acres; and of immature males, 0.89 ± .10 acre. The home ranges of the adult male deer-mice were significantly larger than those of any of the other sex or age classes. The home ranges of the adult male and adult female woodland deer-mice both averaged significantly larger in size than those of the prairie deer-mouse in southern Michigan. The size of the home ranges of adult male chipmunks averaged 2.31 ± .30 acres; of adult females, 2.15 ± .38 acres; of immature females, 1.78 ± .18 acres; and of immature males, 2.66 ± .48 acres. There was no significant difference in size of home range between any of the sex or age classes. In both the deer-mouse and chipmunk, the home ranges of all sex and age classes broadly overlap one another. Individual deer-mice are highly tolerant of one another, but chipmunks frequently are antagonistic toward other individuals of the same species. Bibliography of 7 titles.

Ecology: Of prairie dog

Osborn, Bon. Prairie dogs in shinnery (oak scrub) savannah, Ecology (Prince & Lemon Sts., Lancaster, Pa. $1.50 a copy), 23(1), Jan. 1942, pp. 110-115, 5 photos.

Author's summary: "The occurrence of prairie dogs (Cynomys ludovicianus) in heavily grazed shinnery (Andropogon-Quercus scrub) savannah in Roger Mills County, Oklahoma, is reported. This is an example of the invasion and further modification of one biotic community by an important and characteristic animal of another, following modification of the biota by man and his domestic animals. Factors favoring the spread of the prairie dogs from the original mixed-grass prairie inclusions within the shinnery savannah after homesteading of the land by farmers were (1) modification of the dominant vegetation by grazing by domestic stock, (2) reduction in numbers of predatory animals, and (3) reduced food supply within the original bounds of the colony due to the increase in its own population and grazing by domestic stock. Soil types apparently had little influence upon the local distribution of prairie dogs after the biotic balance was upset. In the presence of continued grazing by domestic stock, the prairie dogs are able to maintain and extend their control over the woody species of the shinnery savannah vegetation type."

Economics: Beaver

Scheffer, Paul M. Beaver on trial, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 239-241, 1 photo.

Bottom lands of a ranch destroyed by erosion after poachers had trapped out beavers were restored by reintroduction of these animals. The proprietor

of a neighboring ranch brought suit for violation of water rights. Taken to the Oregon Supreme Court the right to control the stream and to prevent destruction of the land by erosion was upheld. The effects of the beaver work was to stabilize the creek, raise the level of ground water, and increase forage production.

Economics: Farm wildlife

Miller, J. Paul, and Burwell B. Powell. Game and wild-fur production and utilization on agricultural land, U. S. Dept. of Agriculture, Circular 636 (Supt. of Documents, Washington, D. C. 10 cents a copy), 58 pp., 12 figs., 6 tables, January 1942.

This is the final report on field studies made in 1936 and 1937, preliminary accounts of which were cited in WILDLIFE REVIEWS, Nos. 29, January 1941, pp. 3-5, and 30, March 1941, p. 30. The past and present statuses of game and wild fur are reviewed, especially as to social and economic importance. Among other findings, the authors report (and illustrate by graphs) that the sale of hunting and trapping licenses tends to vary inversely to, and hunting pressure directly with, the density of the human population. Comparing costs of artificially propagated game birds with returns from hunting licenses, "it is evident that the State cannot depend upon pen-reared stock to meet the demand for shooting." The authors also venture, "It seems safe to say that, at present, wildlife production on agricultural land is virtually accidental." Both direct and indirect values of game and wild fur animals are considered; they cannot be statistically compared with those of crops. "Wildlife is of inestimable value to the Nation for it provides esthetic, social, and recreational outlets for the people and it is the foundation of some industries and stimulates activities in many others. But it is evident that the money value frequently attributed to the annual wildlife crops is probably exaggerated." However, "Wildlife is one of our land use crops that has a value sufficiently great to be seriously considered by farmers and land use planners."

In a section on game and wild-fur production and utilization, the authors include their original but previously published estimates of acreage providing food and cover for wildlife by classes of land, acreage on which it is considered economically feasible to improve food and cover for wildlife by classes of land, and of potentially huntable areas. "According to these estimates, it is believed that 48 percent of the land in farms and 81 percent of the agricultural land not in farms are providing food and cover for game and fur animals, and 59 percent of the agricultural land provides 81.6 percent of the wildlife habitat of the country." "When all agricultural land is compared with all nonagricultural land, 59 percent of the former and 68 percent of the latter are providing food and cover for game and wild-fur animals."

As to improvement of habitat, it is estimated "that 58 percent of the land in farms, 90 percent of the agricultural land not in farms, and 70 percent of the nonagricultural land is not providing the quantity of desirable wildlife habitat that could be realized by economical and feasible management. The percentages also indicate that approximately 84 percent of the wildlife habitat considered economically feasible of improvement is on agricultural land, with such land not in farms presenting the greatest possibilities for

wildlife habitat improvement. An inspection of the uses made of nonagricultural land shows that there is little possibility of habitat improvement on this land. Privately owned land provides more than 71 percent of the wildlife habitat that is economically practicable for improvement. As all of the estimated favorable habitat of farm game, approximately 50 percent of that of forest and range game, and about 40 percent of that of migratory game, is agricultural land, it appears that at least 80 to 85 percent of the game has been produced on agricultural land as defined in this publication. Indications are that in recent years farm game has constituted approximately 68 percent of the kill, forest and range game 21 percent, and migratory game 11 percent." Potentially huntable land is from 73 to 87 percent of the areas devoted to agriculture and varies from an average of under 40 acres per license sold in New Jersey and Pennsylvania to more than 11,000 acres in Nevada; the average is 277.

As to farm-game programs, the authors report that they "have not been generally successful when judged from the viewpoint of all parties concerned. Failures are commonly due to inability to harmonize the conflicting interests of the farmers and the hunters. Farmers want more protection for their property and individual rights at little or no additional effort or cost, and the hunters want more game and more hunting opportunities at little or no additional cost. The following incentives seem to be necessary if the land operator is to be induced to provide game and allow the public to use his land in taking it: (1) Protection from trespass occasioned by the presence of game and wild-fur animals; (2) opportunity to receive adequate compensation in the form of money, social, esthetic, or recreational returns for his effort in providing game and allowing semipublic hunting; (3) complete control of hunting and hunters on his property subject to fair and reasonable regulations by law; and (4) custodianship of wildlife on his property subject to fair and reasonable regulation by law."

"No permanent or practical solution to the many problems associated with the production and utilization of game and wild fur on agricultural lands can be anticipated until the agricultural and game interests are brought into closer harmony." General conclusions are drawn and recommendations made. There is a foreword by W. L. McAtee.

Economics: Fur, Iowa

Runkel, Sylvan T. Furs--a million dollar resource in an agricultural state, Soil Conservation (Superintendent of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 237, 1 table.

In Iowa with 95 percent of the land in farms, the returns to trappers are almost a million dollars a year. The table shows the numbers, kinds, and values of furs taken in Jones County in the season of 1935-36.

Economics: Fur, Ohio

Benjamin, Joel R. The 1941 fur crop in Ohio, Ohio Wildlife Research Station (Ohio State University, Columbus) Release 168, 9 pp. (2 occupied by tables, 1 by a map, and 4 by graphs), Dec. 1941.

The tabulations show fur take by species each of the years 1938 to 1941, and the number of pelts bought and the prices paid for them in 1941. From author's summary: "(1) Ohio's fur industry is 'Big Business,' and as such deserves more attention than it has been getting. Any trade that has a turnover of more than two million dollars a year in the raw product can well be considered in the big business class; (2) the muskrat, raccoon, mink and skunk, in that order, are the chief revenue producers and any efforts made to improve fur conditions in the State can well be devoted to them. These four species accounted for 94% of the case value of the 1941 catch and practically the same percentage in previous years; (3) the only marked change in populations of fur species in the last four years is a decrease in the number of weasels reported taken. The opossum has shown an increase, and information obtained from over the State indicates that it is again both increasing in numbers and widening in range, following a serious 'set back' during the severe winter of 1935-36. In most localities the skunk population is making a nice recovery following an epidemic disease decimation of some years ago. The muskrat and mink take fluctuates but all evidence indicates that their populations are practically stationary over most of the State."

Economics: Otter, Sea

Fisher, Edna M. Prices of sea otter pelts, California Fish & Game (Terminal Id., Calif.), 27(4), Oct. 1941, pp. 261-264.

Discussion of former and recent values; the latter are by no means so great as popular fancy pictures; prices actually paid for chiefly confiscated skins sold by the U. S. Government at public auction in the 16-year period, 1924 to 1940, varied from $6.50 to $465; averaged (omitting those of pups) $160. Bibliography of 14 titles.

Economics: Pond

Moss, A. E. Income possibilities from a small artificial pond in eastern Connecticut, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., 75 cents a copy), 6(2), April 1942, pp. 141-146. State College, Pa.

Author's abstract: "Many small ponds or old pond sites are to be found in Connecticut. These are on both active farms and areas purchased for residential use. They involve annual expense if kept dry due to non-usable herbaceous growth. This study was for the purpose of learning the possibilities of obtaining an annual income from such pond areas. The assets considered were muskrats, mallards, fishes, frogs, and water lilies. The result of 8 years' trapping and observations show the possibility of a net income of not less than $10.00 per acre per year where the pond has a depth of less than 3 feet over most of its area."

Education

Bennitt, Rudolf. An introduction to bird-study in Missouri, Missouri Conservation Commission (Jefferson City) Bul. 14, 16 pp., 1 fig., 1941.

Equipment desirable for bird study; procedure in the field; list of 150 common species by families and also by places where likely to occur; list of references.

Education

Evans, Everett F. (chiefly). Conservation, Teachers Manual (Missouri Conservation Commission, Jefferson City), Parts 1-7, 1940-41.

I. (29 pp., 1940). Introduction to the series advancing reasons for teaching conservation; outlining the kinds of natural resources and their preservation, restoration, and management; and discussing man's influence on nature, the common objective in preserving forests and wildlife, use of the crop principle in wildlife management, necessity for conservation regulations, improvement of environment and other restorative practices, and history and status of conservation in Missouri.

II. (31 pp., 1940). Relating to soils, discusses the relation of their conservation to that of wildlife (p. 22). Joint author, Robert M. Davis.

III. (28 pp., 1941). On water, has sections on its necessity for plants and animals (p. 13), and on its special relations to wildlife (pp. 16-18).

IV. (34 pp., 1941). This forestry installment deals with the importance of forests to wildlife (p. 15).

V. (30 pp., 1941). The whole issue relates to birds. It discusses their structure and adaptations, and their principal kinds, gives an account of birds through the seasons, their importance, and conservation.

VI. (29 pp., 1941). Mammals, their kinds and adaptations, importance, conservation, and management.

VII. (37 pp., 1941). Fish.

Each of leaflets II-VII includes a series of review questions, suggestions on pupil activities, and a list of references.

Education: Elementary science books

Gracey, Wilbur T., and Irwin Shappin. Frogs. 46 pp., illus., 1941. (Albert Whitman & Co., Chicago, Ill. 50 cents a copy.)

Prepared by the WPA Pennsylvania Writers' Project, this booklet is intended for use in schools of the third and fourth grades. The account is mostly generalized, references to species being few. Included are remarkable tales about frogs and some account of toads. This is the only one of a series of 33 books by the same agency that relates to terrestrial vertebrates; however, two others on pigeons and bats, respectively, are scheduled for 1942.

Food Habits: Birds vs. codling moth

Neff, Johnson A. Comments on birds and codling moth control in the Ozarks, Wilson Bulletin (Josselyn Van Tyne, University of Michigan, Ann Arbor. 60 cents a copy), 54(1), March 1942, pp. 21-24.

While birds preyed freely upon this apple pest, they did not prevent increase to devastating abundance. Nest boxes were found to harbor the moth larvae over winter. (Could not easily removable and replaceable boxes have been employed?) Birds' nests built in the trees also shelter the insects and are now regularly removed. Crows were destructive in tearing or removing bands used in moth control.

Food Habits: Destruction of fir seeds by shrews

Moore, A. W. Shrews as a check on Douglas fir regeneration, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(1), Feb. 1942, pp. 37-41, 1 pl., 1 table.

Several kinds of shrews were found to consume the fir seeds; the high shrew population may be a partial cause of the relative sparseness of the tree. Report is made on the stomach contents of 17 shrews; plant material 61.25 percent. Control was effected by trapping and by the use of screening cylinders of 1/3-inch wire mesh.

Food Habits: Duck food plants

Eyles, Mary S. Plants of Reelfoot Lake with special reference to use as duck foods, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 14-21.

Annotated lists of species of regional, extralimital, unlikely, and possible, usefulness as sources of food for wild ducks, with chart showing relative abundance at Reelfoot Lake and comparative values as wild fowl food in the lower Mississippi region.

Food Habits: Hard seeds substituted for grit

Beer, James R., and Wayne Tidyman. The substitution of hard seeds for grit, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 70-82, 6 figs., 8 tables.

Authors' abstract: "In an examination of the stomach contents of 323 specimens, including nine game, and one passerine, species, substitution of hard seeds for grit was found to occur. This was noted in Dendragapus obscurus, D. fuliginosus, Bonasa umbellus, Colinus virginianus, Lophortyx californica, and Phasianus colchicus. Substitution was not found in Lagopus leucurus and Perdix perdix, and was doubtful in Canachites franklini and Corvus brachyrhynchos. Factors influencing the habit are shape, hardness, and availability of seeds and the food preferences of the birds."

Food Habits: Nutritional analyses, licks

Anderson, I. V. Licks present interesting problem, U. S. Forest Service Northern Region (Missoula, Mont.) News, Jan. 6, 1942, pp. 26-27, 2 tables.

At the so-called "licks," soil is consumed. Analyses giving the percentages of water soluble constituents of samples from 7 licks are presented. They are not large and include very little common salt. Formula is given for a salt block, used for livestock, but also held worthy of trial for big game.

Food Habits: Salt-eating birds

Peterson, James G. Salt feeding habits of the house finch, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(2), March-April 1942, p. 73.

List of 7 species of fringillids known to eat salt, and account of observations of the habit in house finches, pine siskins, and goldfinches.

Food Habits: Utilization of deerwood

Bond, R. M. Deerwood, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 264.

Value of Lotus scoparius to wildlife and in erosion control in California.

Food Habits: Utilization of grasses

Graham, Edward H. Grasses for soil and wildlife conservation, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 244-247, 250, 1 photo, 1 table.

The great value of grasses in controlling erosion is illustrated by examples. Practices involving the use of grasses are known to benefit wildlife. The utilization of grasses by wildlife is rather fully discussed, and for the 24 most used species, summarized in a table, compiled from records of the Fish and Wildlife Service.

Food Habits: Utilization of kudzu

Davison, Verne E. Does kudzu have wildlife value?, Soil Conservation (Supt. of Documents, Washington, D.C. 10 cents a copy), 7(10), April 1942, p. 253.

Valuable in erosion control and for forage, kudzu is a relished food of cottontails. Its use in preventing removal of lesser legumes is also of indirect value to wildlife.

Food Habits: Yield of wild fruits

Park, Barry C. The yield and persistence of wildlife food plants, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 118-121, 1 table.

Author's abstract: "In connection with the planting of wildlife-food-bearing shrubs and trees on the Monongahela National Forest in West Virginia, observations were carried on to learn the yield and persistence of the fruits of native plants, the objective being to determine which of the species were most desirable for wildlife food planting. Twenty-seven species were under observation for four years. The most consistent bearers, with fruit persisting until late winter of spring were: Ilex decidua, Rhus typhina, Malus angustifolia, Smilax, Vitis cordifolia, Viburnum acerifolium. The most prolific producers were: Amelanchier canadensis, Crataegus, Fagus grandifolia, Malus, Prunus americana, and Prunus serotina. White and chestnut oaks were very good producers but only about a third of the trees yielded acorns. The variation in persistence of fruit for most species was found to be only a few days. Seedling apple trees varied considerably in their ability to hold fruit; variation was greater for this than for any other species, fifty-nine days. The most consistent bearers, with fruit persisting until late winter or spring, generally had a good percentage of plants that bear fruit. From a practicable management standpoint, the variety of species of wildlife food plants rather than the number of specimens of one or several individual species is the factor that makes a good environment for wildlife insofar as the yearlong food, and especially the winter food, supply is concerned. With a variety of food plants, the possibilities for wide fluctuations from year to year in the winter carrying capacity of a good environment are not so great."

Food Habits: Of birds

Beal, F. E. L. Some common birds useful to the farmer, U.S. Dept. of the Interior, Conservation Bulletin 18 (Supt. of Documents, Washington, D. C. 10 cents a copy), 28 pp., 23 figs., 1942.

Mostly brief accounts of the food habits of 26 groups (more than that number of species) of birds. This publication, tracing back through Farmers' Bulletins 630 (and the far earlier 54) of the U. S. Department of Agriculture has been more frequently reprinted, and issued in a larger number of copies, than any other prepared by the Biological Survey, now Fish and Wildlife Service.

Food Habits: Of birds, southeastern U. S.

Beal, F. E. L., W. L. McAtee, and E. R. Kalmbach. Common birds of southeastern United States in relation to agriculture, U. S. Dept. of the Interior, Conservation Bulletin 15 (Supt. of Documents, Washington, D. C. 10 cents a copy), 43 pp., 22 figs., 1941.

General introduction includes a list of 66 kinds of birds known to eat boll weevils. The food habits of 23 species are discussed at moderate length. Supersedes U.S. Dept. of Agriculture, Farmers' Bulletin 755.

Food Habits: Of blackbird, European

Collinge, Walter E. The food of the blackbird (Turdus merula L.) in successive years, Ibis (Taylor and Francis Ltd., Fleet St., London, E.C. 4, England. 12 shillings, 6 pence a copy), Oct. 1941, pp. 610-613, 2 tables.

Comparison of results of food habit studies in periods 10 or more years apart. In the first of these, blackbirds were overabundant and rather destructive; by the second they had decreased and had become less injurious. Summarizing, the author says: "the percentage of injurious insects eaten increased from 22 per cent. to 30.5 per cent., the beneficial and neutral ones were slightly less, and there was a slight increase in slugs and snails and cereals. There is a striking decrease in cultivated fruits and fruit pulp, which drops from 25.5 per cent. to 15.2 per cent. Wild fruits and wood seeds also show an increase of over 10 per cent. In short, the amount of vegetable food of all kinds has dropped by roughly 6 per cent., and the animal food increased by about 16 per cent."

Food Habits: Of chickadee, black-capped

Danforth, Ralph E. Panthestes and Calophya, Science (Lancaster, Pa. 15 cents a copy), 95(2466), April 3, 1942, p. 354.

Black-capped chickadees making a substantial part of their winter diet on jumping plant lice infesting sumacs. Connecticut.

Food Habits: Of crayfishes

Norton, Edna M. The food of the crayfish at Reelfoot Lake, Rep. Reelfoot Lake Biol. Sta. (Tennessee Academy of Science, Nashville), 6, 1942, pp. 51-54.

This report relates to crayfishes as a group, no species being named. "The food of the crayfish from the lake was, Ceratophyllum demersum, 90 percent, and algae, 10 percent. The crayfish from Bayou du Chien contained the following: diatoms, 50 percent; other algae, 20 percent; detritus and vegetation, 20 percent; insects and larvae, 10 percent. Detritus, the first layer of mud, and vegetative debris were abundant from crayfish that were isolated in small pools near the slough." Notes are given relative to the value of crayfishes as food for game fishes, for herons, and for man. Bibliography of 13 titles.

Food Habits: Of deer

Hill, Ralph. What constitutes a deer's menu, South Dakota Conservation Digest (South Dakota Game & Fish Dept., Pierre), Feb. 1942, p. 3.

Supplemental to the report of Fran Haugh (abstracted in WILDLIFE REVIEW, No. 32, November 1941, pp. 28-29), this article summarizes findings from 101 additional stomach analyses, and traces seasonal changes in food. Both white-tailed and mule deer were represented; the data for them are not separated.

Food Habits: Of falcon, prairie

Bond, R. M. Prairie falcon food habits, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(2), March-April, 1942, pp. 79-80.

Pellets collected at 2 nests in Nevada were largely composed of remains of ground squirrels (Citellus mollis). A few other food items are listed.

Food Habits: Of fox, gray

Bennett, Logan J., and P. F. English. Food habits of the grey fox in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 12(12), March 1942, pp. 10-22, 2 figs., 7 tables.

Report upon the contents of 29 stomachs taken from 10 counties from August to February. The results are presented in monthly tabulations giving both frequency of occurrence and volumes of food items. In summary, the leading foods were cottontails (39.8 percent), opossums (15.5), deer (carrion and bait, 11.2), woodchucks (5.7), and muskrats (5.7).

Food Habits: Of fox, red

English, P. F., and Logan J. Bennett. Red fox food habits study in Pennsylvania, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 12(11), Feb. 1942, pp. 6-7, 22-23, 3 figs., 8 tables.

Report on a volumetric study of about 150 stomachs that contained food, presented in text and in monthly and seasonal tabulations. From authors' summary: "Of the foods eaten the five most important were woodchuck, 20.1 percent; cottontail, 19.5 percent; white-tailed deer, 14.6 percent; opossum, 7.8; and grasshopper, 6.0 percent. Incidental items, such as dirt, sticks, red fox hair, leaves, and paper, were frequently found in stomachs of trapped foxes. Some of the woodchucks and deer may have been carrion and bait. Lack of information concerning the bait used by trappers may have resulted in an incorrect picture of the food of the red fox." Bibliography of 9 titles.

Food Habits: Of hawk, sparrow

Hubbard, Douglass H. Sparrow hawk preys on cottontail, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 22(4), Nov. 1941, p. 454.

Texas; prey about 2 weeks of age.

Food Habits: Of lizard, collared

Blair, W. F., and A. P. Blair. Food habits of the collared lizard in northeastern Oklahoma, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 26(1), July 1941, pp. 230-232, 1 table.

Crotaphytus c. collaris. Report on 66 specimens containing food. The identified food items are listed by orders and their frequency of occurrence stated. The table summarizes the data by orders and half-months. Orthoptera were most important in the food, both in numbers and in bulk--"attributable to their ready availability."

Food Habits: Of owl, spotted

Marshall, Joe T., Jr. Food and habitat of the spotted owl, Condor (W. Lee Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(2), March-April 1942, pp. 66-67.

Strix occidentalis. Report on the contents of 5 stomachs and 23 pellets collected in California. The food is distinctly varied, items most numerously represented being crickets, flying squirrels, and bats. The habitat is shaded ravines of coniferous woods in the Transition Zone.

Food Habits: Of skunk, spotted

Crabb, Wilfred D. Food habits of the prairie spotted skunk in southeastern Iowa, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 22(4), Nov. 1941, pp. 349-364, 2 pls., 3 figs., 1 table.

Review of literature (5 titles cited); description of the area and method of investigation; 844 scats were examined and are reported upon according to the season of collection. From author's summary: "Spring food was predominantly mammals. Native field mice were most common and appeared in approximately 80 per cent of 330 spring scats. Insects also appeared frequently and were found in 47.57 per cent of the scats during this period. Summer food was predominantly insects; they were found in 92.35 per cent of 254 scats. Mammals appeared in only 34.97 per cent of the scats. Plant material (mostly fruit) appeared in 26.72 per cent of the scats, while birds and birds' eggs were found in 11 per cent. Birds were eaten more frequently during this period than at any other time. Fall food, like summer food, was predominantly insects; 80.46 per cent of 185 scats contained them. Mammals were also important in this season, appearing in 58.32 per cent of the scats. Fruits such as grapes, mulberries and ground cherries appeared in 36.18 per cent, while birds were found in only 3.78 per cent. Fewer birds appeared during this period than at any other time. The spotted skunk is an omnivorous animal. During this investigation insects seemed to be the preferred food with members of the families Carabidae and Scarabaeidae being taken most frequently. Small mammals were a regular and important item in the diet. Norway rats were eaten freely when other food was difficult to obtain. Cottontail carrion and chicken carrion were taken freely during the winter when they were available. Birds appeared infrequently in the diet, probably because they are more or less unavailable, although they were readily utilized when possible. Grain, such as corn, was eaten frequently when other foods were more difficult to procure. Fruits were taken readily when available."

Food Habits: Of squirrel, fox

Boulware, Jean T. Eucalyptus tree utilized by fox squirrel in California, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 26(3), Nov. 1941, pp. 696-697, 1 fig.

Sciurus niger rufiventer occupying a nest in a blue gum (made of its bark) and gnawing seeds from its capsules.

Food Habits: Of starling

McCoy, John W. Injuries to Texas cattle caused by starlings, Veterinary Medicine (7632 S. Crandon Ave., Chicago, Ill. 50 cents a copy), 36(8), Aug. 1941, pp. 432-433, 2 photos.

Starlings, beginning by pecking at warbles, made extensive wounds that healed slowly and left large hairless scars. Attacks were apparently stimulated by freezing up of ground food supplies but continued after the weather moderated. The wounds were treated with pine tar without very satisfactory results.

Food Habits: Of thrasher, sage

Knowlton, G. F., and F. C. Harmston. Insect food of the sage thrasher, Condor (W. Leo Chambers, 2068 Escarpa Drive, Eagle Rock, Calif. 50 cents a copy), 44(2), March-April, 1942, pp. 76-77.

Summary of the results of examination of 70 stomachs collected in Utah. Two seasonal series are reported upon and for both the insects most numerously eaten were Orthoptera, Hemiptera, and Hymenoptera, the latter chiefly ants. The bird is regarded as beneficial.

Introductions: Partridge, Hungarian

Leopold, Aldo. Spread of the Hungarian partridge in Wisconsin, Trans. Wisc. Acad. Sci., Arts, and Letters (Madison), 32, 1940, pp. 5-28, 2 maps, 5 tables.

By a series of plantings, the species was established in Waukesha County; its spread is described, mapped, and discussed. The gross range occupied now amounts to 7,000 square miles. The birds progressed about 4 miles per year, chiefly by slow overflow. Survival has been confined to the richest agricultural soils. Other plantings and the results of open seasons also are treated. Bibliography of 21 titles.

Life Histories: Blackbird, Yellow-headed

Fautin, Reed W. The establishment and maintenance of territories by the yellow-headed blackbird in Utah, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 1(2), Jan. 1940, pp. 75-91, 1 pl.

Description of colonies; establishment, population, and maintenance of territories; relationships with other species; and discussion. Author's conclusions: "(1) The Yellow-headed Blackbird nests in colonies in which each male establishes and maintains a definite territory; (2) the males are polygamous and from 1-5 females may nest in the same territory; (3) the male establishes his territory only in vegetation which is growing in water although he seems to exercise little choice in kinds of vegetation; (4) the females exercise dominion over a small area immediately surrounding their nests but give no evidence of recognizing the boundaries of the males' territories and do not help the males in defending their territories; (5) the males arrive before the females in the spring and may have their territories established by the time the females make their appearance; (6) most of the food is obtained outside the nesting area; (7) the purpose of territory in this species seems to be: a. to insure adequate nesting sites; b. to aid the females in obtaining mates; c. to afford protection from various interferences during nesting season." Bibliography of 33 titles.

Life Histories: Cottontail

Boule, John D., and Allan T. Studholme. Cottontail rabbit nests and nestlings, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 133-140, 1 pl., 8 tables.

Data concerning the breeding and nesting activities of the cottontail in Pennsylvania during the spring and summer of 1939 and 1940 were gathered and compared. The nesting period extended from the middle of March through September. May appeared to be the most important nesting month. The average number of young in 26 litters examined in 1939 was 5.42; in 1940 the average for 44 litters was 4.95. Each year the litters were generally larger during the first half of the nesting season and became smaller as the season progressed. Tarsal measurements proved to be a satisfactory index of age and the basis for a working scale to determine the ages of nestlings. An evaluation of the cover types used as nesting areas indicated that although more nests were found in fallow fields than in any other cover type, these fields did not have the greatest density of nests. The success ratio of nests under observation in 1940 was 68.5 percent, or slightly greater than the 64 percent of 1939. The pellets of nestlings were used as an index to the success of old nests.--Logan J. Bennett.

Life Histories: Cottontail

Schwartz, Charles W. Breeding season of the cottontail in central Missouri. Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(1), Feb. 1942, pp. 1-16, 1 pl., 2 figs., 6 tables.

A careful and detailed study in which 1,110 individuals were handled. The sex ratio in 703 rabbits was 50.5:49.5. Mating begins about March 1 and continues until early August; the last litters are born in early September. They average 3.8 per female. The number of young averages 4.4 in a litter and 16.7 per female per year. Weights are given for both sexes by months; females average heavier than males. Bibliography of 25 titles.

Life Histories: Dove, Mourning

McClure, H. Elliott. Ecology and management of the mourning dove, Zenaidura macroura (Linn.), in southwest Iowa, Iowa State College Journ. Sci. (Ames. $1.00 a copy), 16(1), Oct. 1941, pp. 93-95.

Abstract of doctoral thesis. Report on a 3-year investigation; nearly 4,000 nestings were observed; success varied from 58 to 37 percent; details as to nesting sites are given; 55 percent of the eggs hatched, and 83 percent of the young were fledged; the greatest factor destructive to nests was weather; the leading predators were blue jays, fox squirrels, cats, and grackles; numerous food items and a few parasites are listed; management suggestions are made.

Life Histories: Fulmar

Fisher, James, and George Waterston. The breeding distribution, history and population of the fulmar (Fulmarus glacialis) in the British Isles, Journ. Animal Ecology (Cambridge University Press, 200 Euston Road, N.W. 1, London, England. 30 shillings a copy), 10(2), pp. 204-272, Pls. 4-8, 18 figs., 11 tables.

An exhaustive summary of general and special investigations, tracing the spread and increase of the species which was known at only one breeding colony before 1878. The additional number of colonies by 1939 was 208 at which breeding was, and 61 at which it was not, known to occur. Total population about 61,000 pairs. The characteristics of nesting sites and of the colonies are discussed. "The social stimulus of numbers is required to enable the fulmars to go through their full breeding cycle." "There are no predators x x x save man." All recorded information on the bird's food habits is summarized. There is a close-set bibliography of 800 titles.

The taking of young is now prohibited as a preventive of transmission of psittacosis to those handling the birds.

Life Histories: Geese

Manning, T. H. Blue and lesser snow geese on Southampton and Baffin Islands. The Auk (Rudyerd Boulton, Division of Birds, U. S. National Museum, Washington, D. C. $1.00 a copy), 59(2), April 1942, pp. 158-175, 1 pl., 1 fig. (map).

Notes on migration (including banding returns), nesting habits, and specific status. The author considers these geese as freely intergrading subspecies. Bibliography of 12 titles.

Life Histories: Goose, Blue

Stiles, Bruce F. "Kungovick," migrant of the Midwest, Iowa Conservationist (Iowa State Conservation Commission, Des Moines), 1(2), March 1942, pp. 1, 3-4, 7, 6 photos.

Notes on migratory flights and stopping places especially in the Missouri Valley, principally for the blue goose, but with some reference to other geese. Chief food in Iowa waste corn; winter wheat is grazed but seldom damaged.

Life Histories: Grebes

Munro, J. A. Studies of waterfowl in British Columbia, the Grebes, Occasional Papers, No. 5, Provincial Museum (Victoria, B. C.), 1941, 71 pp., 9 pls., 4 tables (processed).

Author's abstract: "Colymbus grisegena establishes nesting territories on lakes of moderate size and is not regarded as a colonial nester. Evidence of its attacking other waterfowl could not be substantiated. In the interior small fishes, crustaceans, and insects are eaten. On the coast, fishes are the principal food. C. auritus nests usually on small ponds. The nuptial plumage is rapidly modified by molt and wear during the incubation period. On salt water, crustaceans and small fishes, and in the interior, insects are the main foods. C. nigricollis is shown to be more abundant and to nest farther north than recorded and a recently discovered wintering colony is described. The nuptial plumage is retained until late summer. The food in the interior is aquatic insects and on the coast crustaceans. Aechmophorus occidentalis is known chiefly as a transient in the interior and a winter visitant on the coast. The only known nesting colony in British Columbia is described. Specimens taken on the sea had eaten young herrings and crustaceans. Podilymbus podiceps is the only species nesting regularly on the coast and in the interior. Small fishes and insects are prominent in its diet. With all grebes, the seasonal increase is less than the total of breeding adults. This is attributed to destruction of eggs by flooding and by crows but more particularly to the loss of small young from various causes. Distribution, migration, life history, internal parasites, predation, discoloration of eggs, and colors of soft parts are discussed." Bibliography of 25 titles.

Life Histories: Hare, Snowshoe

Green, Robert G. Glimpses of the snowshoe rabbit, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(19), April 1942, pp. 44-49.

Popular account. Cruising radius is limited, seldom more than a quarter of a mile. Removed a mile, the hares find their way home, but from 2 to 3 miles distance, do not. Two litters of four young each is the average reproduction. Few hares attain the age of 4 years but an occasional animal may become 7 years old. The cycle of about 10 years, and its apparent cause, shock disease, are discussed.

Life Histories: Hawk, Duck

Hickey, Joseph J. Eastern population of the duck hawk, The Auk (Rudyerd Boulton, Division of Birds, U. S. National Museum, Washington, D. C. $1.00 a copy), 59(2), April 1942, pp. 176-204, 7 tables.

In a cooperative survey, 408 nesting sites were reported east of the Rocky Mountains but several times that number are believed to exist. They are principally cliffs, cut-banks, gigantic trees, and high buildings. Factors affecting distribution, density, and fluctuations of the breeding population are discussed. The number of eggs in a set is about 4 in the United States and 3 in the Arctic. Hatching success is 75 percent. Recommendations are made for the preservation, management, and future study of the birds. Bibliography of 23 titles.

Life Histories: Muskrat

Buss, Irven O. Sex ratios and weights of muskrats (Ondatra zibethica zibethica) from Wisconsin, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 22(4), Nov. 1941, pp. 403-406, 1 pl., 2 tables.

Discussion of findings of previous investigator and description of the author's methods of sex-determination. Results as to both sex and weight are tabulated. From author's summary: "The sex ratio of 2,287 muskrats trapped from Pepin, La Crosse, and Dunn counties, Wisconsin, during the fall and early winter of 1939 and 1940 showed 69 percent males or 2.2 males to 1 female. The weights of 352 males and 237 females from Dunn County in November, 1940, show that the males averaged 42 grams less than the females. The weights of 188 muskrats from Mud Creek in Dunn County averaged 5.1 grams less than 356 muskrats from Tainter Lake and Lake Menomin in Dunn County."

Life Histories: Muskrat

Forbes, Thomas R. The period of gonadal activity in the Maryland muskrat, Science (Lancaster, Pa. 15 cents a copy), 95(2647), April 10, 1942, pp. 382-383.

Studies of 222 male, and 340 female, reproductive tracts indicate that "spermatogenesis begins in the middle of December and ovulation in the middle of February and that seasonal gonadal activity terminates in both sexes during the latter part of October."

Life Histories: Muskrat

Seamans, Roger. Lake Champlain fur survey, Vermont Fish & Game Service (Montpelier), State Bul. 3-4, 34 pp., 1 map, tables (processed), 1941.

Relates almost entirely to the muskrat. There is, however, a tabulation of fur sales for 3 species (of which the muskrat is most important) from 1935 to 1940. The distribution of trapping in the State and the habitats of muskrats are considered. The results presented are mainly those obtainable from reports from a sample of the trappers, although a mail questionary also was employed. Variations in trapping success, the sex ratio of the animals, weights, measurements, injuries, pelts, use of carcasses, trapping methods, breeding dates, and size of litters are discussed. Author's conclusions:

"(1) The muskrat catch for the spring of 1941 in the marshes of Lake Champlain averaged only 3.3 percent better than 1940, but better prices for pelts gave the trappers an income nearly approaching the base year of 1939; (2) sex ratio of 1,294 spring trapped muskrats was 65.4% males and 34.6% females. For this sample, no marked change occurred in sex ratio as the season progressed; (3) male muskrats averaged 2.77 pounds in weight and females 2.46 pounds. x x x (4) injuries to spring 'rats appear to be the result of individuals entering another's breeding territory; (5) breeding in 1940 and 1941 did not over-lap the spring trapping season (Feb. 15 to April 19, inclusive). No pregnant females were found in 1940 and only 5 out of a total of 513 in 1941." Bibliography of 19 titles.

Life Histories: Raccoon

Giles, LeRoy W. Utilization of rock exposures for dens and escape cover by raccoons, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(1), Jan. 1942, pp. 171-176, 5 photos.

In eastern Iowa, limestone bluffs were preferred to hollows in trees for denning; details are given. Bibliography of 7 titles.

Life Histories: Redhead

Low, Jessop B. The ecology and management of the redhead, Nyroca americana (Eyton), in Iowa, Iowa State College Journ. Sci. (Ames. $1.00 a copy), 16(1), Oct. 1941, pp. 90-92.

Abstract of a doctoral thesis. Briefed results of a 3-year study near Ruthven, Iowa. Sex ratio 1.42:1; nesting density, 1 nest to 10.6 acres; nest desertion, 30, destruction 13.75 percent; principal agents of destruction: floods, minks, and crows; average number of eggs in a clutch, 9.75; hatch 45.05 percent; details as to nesting and rearing cover are cited; mortality among young, 28 percent; an average of 6.6 juveniles per brood survived; drainage, drought, and overshooting were the three principal causes for decline in numbers of redheads within recent years; management suggestions are made.

Life Histories: Ring-tailed cat

Richardson, Wm. B. Ring-tailed cats (Bassariscus astutus): their growth and development, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 23(1), Feb. 1942, pp. 17-26, 1 pl., 5 figs.

Observations on captive animals; appearance, behavior, and growth of young, and their care by the mother are described. Natural foods are listed.

Life Histories: Shrew-mole

Dalquest, Walter W., and Donald R. Orcutt. The biology of the least shrew-mole, Neurotrichus gibbsii minor, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(2), March 1942, pp. 387-401, 4 figs.

Description of the animal, its habitat in northwest Washington, its habits, traits, parasites, and enemies. Notes are presented on feeding habits of captives; contents of collected stomachs were largely composed of earthworms, isopods, and insect larvae and pupae. Bibliography of 13 titles.

Life Histories: Sparrow, White-crowned

Blanchard, Barbara D. The white-crowned sparrows (Zonotrichia leucophrys) of the Pacific seaboard: environment and annual cycle, Univ. Calif. Publ. in Zoology (University of California Press, Berkeley. $2.00 a copy), 46(1), pp. 1-178, Pls. 1-20, 30 figs., 1941.

The systematic status of the two subspecies studied is set forth in text and maps; variation is hardly more geographic than individual. Behavior, including all activities of the reproductive cycle, is fully discussed; these are abbreviated in the northern, as compared to the southern, range, chiefly by omission of a pre-incubating period (about 50 days) of more holding of territory; greatest differences in the life-histories of the subspecies were those in which greatest individual variations were observed. The gonad cycle is exhaustively described and illustrated and its correlation with meteorological factors considered. Migration is not a last-moment effect of contemporaneous climatic conditions but occurs in strict correlation with a complex and deep-seated physiological development that has been long in progress.

Life Histories: Squirrel, Fox

Allen, Durward L. Populations and habits of the fox squirrel in Allegan County, Michigan, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 27(2), March 1942, pp. 338-379, 19 figs., 12 tables.

History of the species in Michigan; description of the area and methods of the study. Variations in population density by seasons and years are commented upon, average in fall considered to be one squirrel to 3-4, and in winter one to 5-6, acres. Nests are made in tree cavities, by preference, but due to the general scarcity of such dens, leaf nests are much used; their materials and sites are described. Sex ratio in 324 animals was 44.51:55.49. Sexual cycle and breeding are fully discussed, particularly as evidenced by physical characteristics. Yearling females usually have a single litter, but older females mostly produce two broods, annually. The average number of young per litter is three. The young are not self-sustaining until between three and four months of age. Scabies is of some importance as a cause of mortality. The mean weight of healthy adults is 1 lb. 11 oz. There are incidental references to food. Predation is unimportant but highway mortality is conspicuous. Bibliography of 28 titles.

Management: Attracting birds

Kalmbach, E. R., and W. L. McAtee. Homes for birds, U. S. Dept. of the Interior, Conservation Bulletin 14 (Supt. of Documents, Washington, D. C. 10 cents a copy), 24 pp., 10 figs., 1 table, 1942.

Supersedes U. S. Dept. of Agriculture Farmers' Bulletin 1456. Treats the origin of the nest box idea; use of nest boxes in the United States; increasing birds by providing nesting facilities; principles of constructing, locating, and caring for nest boxes; proper dimensions of houses for various birds; and supplying nesting thickets and roosting shelters.

Management: Attracting wildlife by den boxes

Hosselschwerdt, R. E. Use of den boxes in wildlife restoration on intensively farmed areas, Journal Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 31-37, 4 pls., 2 tables.

Author's abstract: "One year's study of 56 den boxes placed in fencerow trees, hedges, and woodlots on a 4-square-mile area of the black soil cornbelt prairie of central Illinois has shown that such boxes are a definite aid to fox squirrels (Sciurus nigor), screech owls (Otus a. asio), and sparrow hawks (Falco s. sparverius). A total of 7 species used the boxes during the year. Constructed of rough cypress lumber, the boxes were 3' deep and 10" square inside with openings 5" in diameter. All were located in a region where natural tree cavities are scarce. Greatest utilization occurred in March, April, and May during the nesting seasons, and least during the summer months. Fox squirrel distribution was influenced by the sites of the boxes. Five litters of young fox squirrels born in the boxes averaged 3.2 individuals. Five broods of screech owls totaled 22 young or 4.4 per brood. Sparrow hawks used the boxes for nesting only. Six opossums resorted to the boxes for daytime shelter. The boxes were an important aid in studying the food and nesting habits and populations of the species using them."

Management: Beaver transplanting

Pierle, C. B. Beavers move in, West Virginia Conservation (Conservation Commission of West Virginia, Charleston. 10 cents a copy), 5(9), Dec. 1941, pp. 4-5, 19, 1 photo.

In 1929, beavers were practically extinct in the State; as a result of introductions, which are listed, there were in 1941 about 200 colonies in 16 counties. Both woody and herbaceous food plants are recorded. Some damage has been done to corn, wheat, oats, and cucumber vines; the animals responsible were trapped and moved to public reservations.

Management: Bob-white

Davison, Verne E. Soil conservation favors bobwhite, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 251-252.

The foods revealed as most important by examination of nearly 6,000 crops of bob-whits may be adequately produced on farms carrying out approved erosion control programs in the Southeast. Legumes customarily used in stripcropping are important though rivalled by the oaks with their acorn production.

The value of shrubs as fruit-bearers and of annual and perennial herbs is briefly noted. "A soil-conservation plan including uncut sericea field borders, shrubby woodland borders, protected stream banks, hedges, and small shrub areas, should improve and assure adequate food for bobwhites on farms that have strip-crop rotations, woodland management (including controlled burning when desired and protection from grazing), improved pastures, protected crop residues, and perennial hay supplies. Thus, a soil-conservation plan favors the proper distribution of shelter among those foods known to be particularly useful to the bobwhite quail, and so may contribute materially to the increase of this desirable bird."

Management: Bob-white

Davison, Verne E. Bobwhite foods and conservation farming, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 97-109, 1 fig., 1 table.

The Soil Conservation Service recognizes wildlife improvement programs as inseparable from agricultural objectives in soil conservation. Conservation of bobwhites (Colinus virginianus) is only a small part of the farm problem, but to many southeastern laymen these birds symbolize wildlife. As many management recommendations are too complicated for farmers to adopt, the author studied dry contents of 5,889 bobwhite crops taken by hunters during three hunting seasons from a wide section of the Southeast with a view to formulating simple suggestions. Non-food items were discarded and food quantities less than 1 percent by volume were ignored. Comparing local summaries, it became clear that there was no indispensable food item. Farm game management must be based on staples which insure life and health, and changing agriculture necessitates the replacement of food formerly produced on idle lands. Crops (5,189) collected above the lower coastal plain, separated from those (700) from that region, are the basis of the discussion. Foods (130 kinds) were listed under five groups according to importance. Suggestions as to how staple foods may be produced incidentally are made for five land-use classes. Simple management practices are recommended as follows: (1) Grow annual lespedezas and small grains in crop rotations as a source of waste foods; cowpeas and soybeans are valuable with corn; bullgrass and crabgrass may be left at final cultivations; (2) provide mast of oaks, gums, pines, hickories, and ashes in woodlands; (3) establish wildlife borders of shrubs and Lespedeza sericea for summer fruits and winter emergencies; protect shrubs in marshy areas, on stream banks, in fencerows, on rocky outcrops; and (4) plant kudzu or sericea for hay so that annual legumes can be returned to the soil and at the same time a supply of their seeds be assured for wildlife.--J. A. Johnson.

Management: Bullfrog

Baker, Rollin H. The bullfrog. A Texas wildlife resource, Texas Game, Fish, and Oyster Commission (Austin), Bul. 23, 7 pp., 1942.

Life-history; consumption in Texas is about 300,000 lbs. annually; market price averages about 35 cents a pound; over-hunting has caused a decline in the take; it should be regulated and management adopted; suggestions are given.

Management: Burning

Conarro, Raymond. The place of fire in southern forestry, Journ. Forestry (Mills Bldg., Washington, D. C. 50 cents a copy), 40(2), Feb. 1942, pp. 129-131.

This and a companion article, "The use of fire in the flatwoods of the Southeast," by C. A. Bickford (pp. 132-133) are cited for the benefit of those who wish to keep abreast of the discussion of burning. Its use in wildlife management is incidentally mentioned. Its utility in forestry is the main subject of those papers, and it is significant that such usefulness is admitted.

Management: Cottontail

Haugen, Arnold O. Cottontails need more cover, Michigan Conservation (Michigan Dept. of Conservation, Lansing), 11(4), April 1942, pp. 5-9, 11, 4 cartoons.

The extent of individual ranges varies inversely to fertility of the land; in scrub oak country they may cover up to 22 acres for females and 100 acres for males. The production of young is great but so is mortality. Burning should be avoided during the nesting season (April 1 to September 1) and steps should be taken to improve the quality and availability of cover. Artificial burrows and brush piles when developed with paid labor are too costly for large scale use. Artificial feeding and restocking also do not seem to justify themselves. Sparing existing cover and excluding grazing to develop other shelter, with, when possible, a certain amount of planting are measures most likely to aid the rabbit population. Specific recommendations are made.

Management: Farm game

Hutchins, Ross E. Farmers can raise more game, Better Crops with Plant Food (1155--16th St., N. W., Washington, D. C. 10 cents a copy), 25(8), Oct. 1941, pp. 14-16, 38, 3 photos.

Encouraging resident game, a product of the soil, by management of cover, planting of shrubs, trees, and herbs, and controlling erosion.

Management: Farm game

Thornton, J. E. Improving conditions for farm wildlife, Virginia Wildlife (Blacksburg, Va. 10 cents a copy), 5(1), Fall-Winter, 1941-42, pp. 11-14, 1 photo.

Farmers have to make a living and cannot afford to manage lands primarily to produce wildlife. However good farm management practices, especially in soil conservation, are beneficial also to wildlife. Suggestions are given as to the trimming of bushes in fencerows, and on ditch and stream banks. The treatment of field borders and galled spots for erosion control is described and suggestions made as to shrub planting, food patches, and winter feeding. Cats and dogs should be controlled. Formula for a food patch mixture immediately follows this article.

Management: Farm wildlife

Brown, Leo. The management of farm wildlife, Trans. Kansas Acad. Sci. (Topeka), 44, 1941, pp. 381-388.

The author discusses mainly the bob-white, pheasant, cottontail, and fox squirrel, and concludes: "Wildlife is an organic resource and can be managed on a sustained yield basis. Farm wildlife is a product of the land and management practices are of vital importance to increased production. Wildlife cannot be considered separate and apart from its environment; as a consequence, its management must make provisions for a satisfactory environment. Wildlife environments in most cases have values in themselves in addition to their value to wildlife. Income from wildlife may in some instances be adequate to offset carrying charges accruing on a wildlife environment that is being managed to increase wildlife production. The ecology of threatening species should be worked out with special emphasis on the factors of disease, competition, harvesting of game crop and maintenance of favorable habitats." Bibliography of 8 titles.

Management: Farm wildlife

Grange, Wallace B., and W. L. McAtee. Improving the farm environment for wildlife, U. S. Dept. of the Interior, Conservation Bulletin 12 (Supt. of Documents, Washington, D. C. 10 cents a copy), 56 pp., 20 figs., 3 tables, 1942.

Discusses cover, food supply, protection, and inventory of farm wildlife. Supersedes U. S. Dept. of Agriculture Farmers' Bulletin 1719 from which it is slightly revised.

Management: Farm wildlife

Pratt, H. P., and W. S. Long. Wildlife management on irrigated farms, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 257-258.

Although irrigation transforms barren areas and may greatly improve conditions for wildlife, practices on irrigated farms may destroy most of the gain. Burning ditch banks and overgrazing are two of the most objectionable factors. When these are stopped, wildlife production rebounds. Counts of quail and pheasants are cited in illustration. Suggestions are made also as to the management of ponds.

Management: Farm wildlife

Towns, Homer G., and Harvey D. Burkhalter. Providing for wildlife in farm planning, Soil Conservation (Supt. of Documents, Washington, D.C. 10 cents a copy), 7(10), April 1942, p. 254.

Use and production of a Louisiana farm before and after planning. Not only crops but wildlife benefitted, the latter chiefly through great increase in habitable "edge."

Management: Farm wildlife

Wilson, Kenneth A. Suggested practices for the improvement of conditions for wildlife on the farms of Maryland, Maryland Conservationist (514 Munsey Bldg., Baltimore, Md.), 19(1), Winter 1942, pp. 26-28.

Clean farming was bad not only for wildlife but for the land itself. By proper practices, conditions may be improved with respect to both animal conservation and erosion control. The author's suggestions relate to the planting of gullies, field borders, and food patches, the utilization of evergreens, contour hedges, and windbreaks, and to winter feeding.

Management: Farmer-sportsman relationship

Fox, Adrian C. Farmers-sportsmen relations improving, Dakota Farmer (Aberdeen, S. Dak.), 61(21), Nov. 8, 1941, p. 444, 1 fig.

On lands managed in cooperation with the Soil Conservation Service, the North Dakota Wildlife Federation has posted signs reading, "No Hunting or Trapping Without Permission." This has aided wildlife management on farms, enabled the farmers to control hunting, and given the sportsmen better hunting.

Management: Food patches

Freeburn, C. C. Plant a game food plot, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(1), April 1942, pp. 13, 22, 30, 3 photos.

Formula for the Pennsylvania Game Food and Cover Plot Mixture; list of trees and shrubs suitable for wildlife plantings; management suggestions; and references to publications of the Commission containing fuller information.

Management: Food patches

Wallace, George J. A three-year trial with a food patch for songbirds, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 110-117.

Author's abstract: "A 1-1/2 acre plot tilled and sowed with millets, sunflower, and buckwheat over a three-year period attracted large numbers of seed-eating fringillids in the fall, but failed to lure previously unrecorded species. Though migrating birds made intensive use of the patch, the abundance of readily available feed did not perceptibly alter their schedule of migration, except that a few summer resident birds that formerly left in August lingered into October. A serious but unavoidable short-coming of food patches for songbirds in the northern states is the short period of availability of the food. An annotated list of 17 species of birds making more than incidental use of the plot is given."

Management: Fencerows

Dambach, Charles A. Fence row facts, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 238.

A very compact article, hence difficult to abstract. "In the agricultural sections of Ohio and Indiana, the amount and distribution of fence-row vegetation probably affects farm wildlife more than any other factor." Fencerows not only support wildlife, but aid in erosion control, produce fruits, nuts, and ornamental sprays, and add to the attractiveness of farms. Of the insects they harbor, most are harmless, and about a third are beneficial. Similarly, most of the rodents benefited by them are not the kinds that attack crops. The plants in fencerows chiefly are not woods as these annual and biennial species stand little chance of becoming established under the shade of shrubs and trees. Fencerows are necessary and they should be well managed. The author advises against burning.

Management: Fencing

Allan, Philip F., and Palmer R. Sims. Barbed wire conserves soil and wildlife, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 263-264.

Even a bare wire fence is of some use to quail as a protecting travelway. Barbed-wire used to enclose small areas permits them to revegetate and improves them both as to erosion control and wildlife utilization. Notes are given on the vegetation and wildlife of such protected areas.

Management: Field borders

Davison, Verne E. A better distribution of food and shelter, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh, N. C.), 5(3), March 1942, pp. 8-10, 14, 2 photos.

There are food and shelter enough for game in North Carolina but they are not distributed to the best advantage. The author points out how field borders of Lespedeza sericea and shrubs can be used to remedy this defect.

Management: Field borders

Davison, Verne E. Shrubs by direct seeding, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 242-243, 2 photos.

Shrub plantings for erosion control and also for wildlife values should be dense. To make them so by ordinary methods is too expensive but by direct seeding, it is practical. Two shrub lespedezas (L. bicolor and L. cyrtobotrya) have been tested in the Southeast and are recommended. Directions are given for their planting.

Management: General

Gobeil, René. La cynégétique aux Etats-Unis et chez nous, La Foret Québecoise (2, Côte d' Abraham, Québec, Canada. 10 cents a copy), 4(1), Jan. 1942, pp. 29-48.

A survey of wildlife conservation and management in the United States, dealing with: Game inventories and the methods used in making them; management of forest game; propagation and introductions; predation and predator control; hunting regulations; parks, preserves, and sanctuaries; sample plans of management of the ruffed grouse and beaver; and interested government organizations. The conclusion is drawn that Canadian wildlife also has a value warranting governmental attention to its management. Bibliography of 19 titles.

Management: General

Leopold, Aldo. Wildlife conservation on the farm, Reprinted from the Wisconsin Agriculturist and Farmer (presumably obtainable from the author, University of Wisconsin, Madison), 24 pp., covers, illus.

The articles on wildlife mentioned in WILDLIFE REVIEW, No. 22, August 1939, p. 48, have been collected in pamphlet form as cited. Headings indicating the contents are: Winter cover, winter food, woodlot wildlife, the farm pond, the marsh, wild flower corners, wild foods, look for bird bands, evergreens for cover, stories in the snow, windbreaks, when the geese return, feeding stations, winter care of plantings, feed the song birds, bluebirds welcome, pheasant planting, bur oak is badge of Wisconsin, sky dance of spring (woodcock), and wild life likes water.

Management: General

MacNamara, L. G. Wildlife management in New Jersey, State Fish and Game Commission (Trenton), 107 pp., illus., tables, 1940 (rec'd March 1942).

Description (and map) of the geographic provinces of the State including lists of characteristic plants and game species and comment on agricultural practices in relation to wildlife. Considerable attention is given to food patches, and the success of various seed mixtures reported in detail by regions and years. Evidence of food patch utilization derived from direct observation and crop analysis is tabulated. The progress of environmental development in the different regions by planting trees and shrubs and by other procedures is fully recorded. A few problem species are commented upon. Beavers reported injurious are trapped and transplanted, and requests for beaver stocking are more than the supply will satisfy. Cottontails also are transplanted to solve economic problems. The numbers of these two species trapped and liberated in various years is recorded. Deer damage a number of cultivated crops, blueberries, beans, sweet potatoes, and tomatoes being mentioned in the largest numbers of complaints. Tests of repellents, scarecrows, and electric fences as control measures are reported upon. A considerable body of deer weights and measurements is tabulated.

Management: General

Swanson, Gustav. Encouraging wildlife on Minnesota farms, Univ. of Minnesota (Minneapolis) Agr. Expt. Service, 4-H Bul. 23, 12 pp., illus., 1940 (1942?).

An introductory section (with bibliography of 7 titles) is followed by others (each with a cartoon-type illustration) bearing on: Protection of woodlands and gullies, placing brush piles in wooded pastures, planting pond areas, stream bank protection, brushy fence rows and odd corners, the flushing bar, food patches and emergency feeding for winter, and leaving some [game] for next year.

Management: Grouse, Ruffed

Edminster, Frank C. More ruffed grouse from woodland management, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 261-262, 1 photo.

Good habitat for this species is defined. It can be maintained by practices that also benefit the woodland. The first requirement of both trees and birds is to eliminate fire and livestock. Selective cutting should be practiced to maintain openness of stand and to preserve the woody plants that are most valuable in providing grouse shelter and food. Measures for developing the woodland margin also are suggested.

Management: Harvesting, waterfowl

Baumgartner, F. M. An analysis of waterfowl hunting at Lake Carl Blackwell, Payne County, Oklahoma, for 1940, Journ. Wildlife Management Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 83-91, 4 figs., 4 tables.

Author's summary: "Controlled waterfowl hunting at Lake Carl Blackwell, Payne County, Oklahoma, was conducted by the Experiment Station of Oklahoma A. & M. College, Stillwater, during the 1940 season. The information obtained from a complete record of the kill may be summarized as follows: (1) 2,081 ducks and 5 geese were bagged in 1,252 hunters' days, a daily average of 1.67 birds per hunter; (2) hunting pressure was heaviest during October and the first half of November; it declined sharply after the opening of the quail season on November 20; (3) overcrowding on Sundays materially reduced the average daily kill; (4) hunters were, in general, satisfied with controlled hunting; (5) sixteen species of game ducks and two species of geese were taken. Almost 90% of the kill consisted of the green-winged teal, pintail, mallard, ring-necked duck, baldpate, gadwall, and redhead; (6) with a few marked exceptions the kill records expressed fairly accurately the numerical relations of the waterfowl; (7) listed in order of importance to the hunter over the entire season were the pintail, green-winged teal, mallard, baldpate, gadwall, and ring-necked ducks; the others were of minor significance; (8) data collected on crippling losses suggest that one duck was lost for every bird brought to bag; (9) the total mortality was estimated to be 2.8% of the waterfowl population of the lake;

(10) hunting did not prevent the closed half of the lake from satisfactorily functioning as a feeding and resting refuge for several thousand waterfowl throughout the season; (11) the controlled hunting was a financial success."

Management: Hedgerows

Majure, Wallace J. Hedgerow management with special reference to insect populations, North Carolina Wildlife Conservation (Division of Game and Inland Fisheries, Raleigh, N. C.), 6(2), Feb. 1942, pp. 8-11, 2 photos.

Clearing and burning of hedgerows and ditch banks is done chiefly to control insect pests. Observations on a wildlife experiment farm near Raleigh showed that in the growing season, as would be expected, the injurious insects were very largely in the crops and that in winter a greater number of beneficial than of destructive insects were found hibernating in the hedgerows. Average figures for 2 winters are, respectively: 6.5, and 27.7 beneficial, to 1.2 and 5.6 injurious, insects per square yard. Properly managed hedgerows may, therefore, cause a decrease rather than an increase in harmful insects. They are also of value in conserving soil and moisture and in serving as travel lanes and shelter cover for wildlife. Bird nests were found in hedgerows at the rates of 5 and 10.5 per acre in the years 1940 and 1941. Recommendations are made as to plants that should be left in, and others that should be removed from, hedgerows. It is also "suggested that if hedgerows are shrubbed in alternate 100-foot strips or blocks it would save denuding the area for its entire length at any one time and allow some of the vegetation to remain as cover for wildlife. Similarly, ditchbanks may be managed. Alternate sides are shrubbed during alternate years."

Management: Inventory, brant, black

Moffitt, James. Eleventh annual black brant census in California, California Fish and Game (Terminal Id., Calif.), 27(4), Oct. 1941, pp. 216-235, figs. 59-63, 1 table.

Results are discussed for 8 localities and tabulated for 7 for most of the 11 years. The count was somewhat above the average but was 19 percent less than that for 1940. Migration and unusual nesting of the brant are discussed. A shortage of eelgrass apparently due to the same cause as that occurring earlier on the Atlantic coast has reached alarming proportions, and may become such a threat to the brant as to call for their stringent protection. Certain defense activities also are adversely affecting the birds.

Management: Inventory, dove, mourning

McClure, H. Elliott. Mourning dove production in Iowa, Auk (Rudyard Boulton, Division of Birds, U.S. National Museum, Washington, D. C. $1.00 a copy), 59(1), Jan. 1942, pp. 64-75, 8 tables.

Author's summary: "From March to October of 1938 and 1939 nesting of the Mourning Dove was observed in a 220-acre area in southwestern Iowa at Lewis. One hundred and sixty acres of this were in Lewis and the remainder

scattered among farmyards, gullies, and woods. During the two years, 250 breeding pairs in 1938 and 330 pairs in 1939 made a total of 3,439 nesting attempts. Each pair built about six nests and one-half of the nesting attempts were successful in rearing young. x x x In the two years, 3,085 young were reared. Of the young that hatched, 87 per cent were successful in leaving their nests, but only 48 per cent of the eggs that were laid produced successful young. Although there were 32 per cent more breeding doves in 1939 than in 1938, decimating factors reduced production of young to but 7.86 per cent more for 1939. A method of censusing the dove population by counting active nests in sample areas is given. Nests are counted and then multiplied by standard figures to give the total young that may be produced by the end of the season."

Management: Inventory, forest wildlife

Anon. Annual Wildlife Report, 1941 (U. S. Forest Service, Region 1, Missoula, Mont.), 32 pp., 12 tables (mimeographed).

Five pages of text give a summary of the condition of wildlife populations and of Service activities in the Region in behalf of wildlife. The bulk of the leaflet is made up of tables presenting estimates of wildlife populations, hunter and trapper takes, and drains due to predation, starvation, disease, poaching, and other causes. Records are included also of hunter and angler use, refuge and other restricted areas, and the distribution of salt for game.

Management: Inventory, forest wildlife

Anon. Annual Wildlife Report, 1941 (U. S. Forest Service, Region Six, Portland, Oreg.), 15 pp. (mimeographed, mostly tables), 1942.

General statement of wildlife conditions in the Region; brief account of accomplishments in management, education, investigation, and cooperation; statistical information, including estimated numbers of big game and fur animals, predators, and game birds on the forests of the Region; data on hunter and trapper take, kill by predatory animals, hunter and fisherman use, restricted areas, grazing, and law enforcement.

Management: Overpopulation, deer

Olson, H. F. Superior Forest deer studies, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 3(17), Feb. 1942, pp. 52-56, 3 tables.

Censuses by the drive method have been taken on sample areas since 1935. The deer counted are recorded by sex and age classes, and the estimated numbers per section and on the Forest tabulated. The section figures vary from 10.8 to 16.8. The numbers and average weights of bucks, does, and fawns taken by hunters also are set forth in a table. The total kill in 7 seasons was 19,430; the percentage of hunter success, 61. Tagging studies indicated average movements of 5.6 miles for bucks and 3.1 miles for does; also a sex ratio of 45.5: 54.5. The causes of deer deaths in winter are stated and the total losses on

the Forest estimated. Winter food supply is the most important factor limiting the size of the deer herd. "The Forest Service recognizes the value of deer from the viewpoint of hunting, as well as the esthetic value to tourists and nature lovers. It will continue to manage the forest in such a manner that it will support as many deer as possible. The rate at which deer have increased each year means there will be a surplus above the normal carrying capacity which must either die or be removed by hunting. Management should provide for removing as much of this surplus as possible without decreasing the breeding population."

Management: Overpopulations, deer

Shadle, Albert R., and Donald Stullken. The deer of Allegany State Park, New York, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 27-30.

Authors' abstract: "Observations from July, 1936 to August, 1940. A very marked increase in white-tailed deer (Odocoileus v. virginianus) has been due to: (a) Migration from Pennsylvania, (b) practical absence of predators, and (c) protection from hunters. These conditions have resulted in: (a) Increase of deer beyond winter carrying-capacity of the area, (b) localized overbrowsing of winter foods and some summer foods, (c) distinct browse damage to much young native and introduced evergreen growth, and (d) death of a large number of deer, particularly the immature ones, in the winter of 1940. Recommendations: (a) Determination by deer management expert of: (1) winter carrying capacity of the Allegany State Park Area and (2) approximate number of over-population now present; (b) reduction of the present herd to determine winter carrying-capacity: (1) by a pre-season community deer drive to force excess deer out of Park area, thus available to hunters (method advised), or (2) by rangers and wildlife management experts. Other possibilities: (a) Control by ranger-directed hunting parties (impractical); or (b) open season (very undesirable) under strict regulations as to ages, sex, and numbers to be taken."

Management: Planting for wildlife and erosion control

Anderson, Wallace L. Adolph Lee looked ahead, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 251.

Control of stream bank erosion by planting willows created new environment for wildlife and attracted additional species to the farm. Details given.

Management: Planting for wildlife and erosion control

Culbertson, R. E., and Richard M. May. Planting spoil banks and ditches, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 260.

Directions are given, and planting materials suggested for vegetating these areas. When accomplished, "croplands adjoining ditches become accessible to a larger number of farm wildlife species, and openings through woodlands are transformed into more widely usable wildlife habitats."

Management: Planting for wildlife and erosion control

Hawbecker, A. C., and R. M. Bond. Wildlife increased by erosion control practices, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 255-256, 2 photos.

Tree planting to control sheet erosion, consideration being given wildlife in selection of species and in leaving openings, brought a great increase in birds. Development of a water supply was similarly effective. Details are given.

Management: Ponds

Austin, Stanley W. A story of pond protection, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 262, 2 photos.

Transplanting river bulrush from local sources (Kansas) to protect an earthen dam from wave action, achieved that result and also attracted muskrats, red-winged blackbirds, and other wildlife.

Management: Prairie chicken

Carlson, C. Edward. The prairie chicken in Minnesota, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 4(20), May 1942, pp. 45-49.

The term prairie chicken includes both the pinnated and sharp-tailed grouse. Distinctions and contrasting local names of the species are pointed out. Decrease in numbers and in range is described. The birds are cyclic and each successive peak seems to have been lower than the last, with eventual extermination indicated. Life histories and inimical factors are succinctly treated and recommendations made for preservation and restoration of the birds.

Management: Refuges

Makarov, V. N. Natural Preserves of the U.S.S.R., The Popular Science Library. State Publications, Collective and Soviet Farm Literature (Moscow, Russia), 153 pp., 85 photos, 2 color plates, 1940.

This is the first book on the natural preserves of the U.S.S.R. In it are described most of the 47 sanctuaries for wildlife and the natural flora of the Soviet Union. These sanctuaries are scattered throughout the Union from Crimea to Kamchatka, covering altogether 10,071,790 hectares. The preserves are classified according to their geographical location as follows: (1) Plain-forest, (2) mountain-forest, (3) forest-steppe, (4) steppe, (5) insular, (6) semi-arid zone, and (7) arid zone. Several preserves are devoted exclusively

to certain animals, such as the mink. Some are maintained strictly in a natural state for scientific and educational purposes; from others certain economic benefits are derived.

A chapter is devoted to each preserve. The author describes briefly the soil and geographic and climatic conditions, gives some data concerning the natural history of the region, sometimes several centuries back, mentioning many extinct animals. Particular attention is paid to restoration of rare species and acclimatization of introduced wildlife in different regions. The author gives prominent place to statistics, presenting the latest available figures on the numbers of species, colonies, nests, etc. Food supplies and natural phenomena affecting wildlife, such as floods, droughts, etc. are also considered. Plant associations of each sanctuary are fully described in relation to wildlife.--Vera Turin.

Management: Refuges

McAtee, W. L. Local bird refuges, U.S. Dept. of the Interior, Conservation Bulletin 17 (Supt. of Documents, Washington, D. C. 10 cents a copy), 17 pp., 4 figs., 1 table, 1942.

Topics: Bird refuges on farms, wood lots, roadsides, rights-of-way, community parkings, municipal parks and picnic and fair grounds, school and college grounds, cemeteries, reservoirs, and golf courses. The table lists groups of fleshy fruits most attractive to birds, the number of species of birds known to eat them, and names the more common birds that utilize the fruits. Supersedes U. S. Dept. of Agriculture Farmers' Bulletin 1644.

Management: Refuges

Spooner, Charles S., Jr., and Lee E. Yeager. Potential wildlife habitat on the Illinois Prairie and some problems of restoration, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 44-54, 3 tables.

Authors' abstract: "On Illinois black prairie farms scarcity of cover is the chief deficiency of the upland game habitat. To measure this deficiency, and to determine the availability and cost of developing land for wildlife refuges on the prairie, a Federal Aid project was organized. Land for refuge development was found to be available, without purchase, in scattered tracts and obtainable through long-term easements. Such areas consist of woodlots, eroded fields, drainage ditches, strips along hedgerows, old orchards, gravel pits, and undrained prairie. Development included posting, fencing, planting, and certain erosion-control measures. The cost will be about $1.50 per acre per year over a 10-year period, but succeeding projects should show a materially lower expenditure. Taxes amount to about $1.00 per acre per year and are paid by the owner. Reasonable flexibility in regulations appear to be necessary to insure ample availability of land for refuges on the prairie, and an orderly harvest of game to maintain interest of the landowners. The plan shows promise in the Illinois grain belt, but some of its applications must be further analyzed before its entire success is proved."

Management: Refuges, big game

Anderson, I. V. The refuge as a game management factor in Montana, Field Notes on Wildlife (U. S. Forest Service, Northern Rocky Mountain Region, Missoula, Mont.), 2(10), Dec. 1941, 7 pp. (processed).

This paper deals with the history, legal aspects, and purposes of refuges in the region; tells how they were established; and discusses their sizes, limiting factors, and the substitution for them of game management areas. Author's summary: "Back-tracking over game management practices in Montana we find an era in which practically all sportsmen's groups, as well as public agencies, favored and sponsored establishment of game refuges. This period was from 1910-1925. At that time the weaknesses of permanent refuges for big game started to manifest themselves in the way of sore spots on the range and abnormal losses from disease and starvation. Concurrent with these manifestations of overutilization by game, big game populations were definitely on the up trend. By 1930 the weaknesses of the big game refuge were definitely recognized and a number of refuges had already been altered or abolished. Throughout the years sportsmen and various interested public agencies have developed a sense of proprietorship in some of the refuges and have vigorously opposed abolition. However, it is anticipated that the unit game management idea will soon be accepted by these groups and result in one more progressive step in the management of big game in Montana."

Management: Stocking, cottontail

Anon. Live rabbit sales reach high figure, Missouri Conservationist (Conservation Commission, Jefferson City, Mo.), 3(6), Jan. 1942, pp. 2-3, 1 fig.

History of the business in Missouri. The highest number marketed in one season was 237,000 in 1937-38. The drain appears to have little effect upon the rabbit population. Average price is 75 cents per animal.

Management: Stocking, quail

Richardson, Frank. Results of the southern California quail banding program, California Fish & Game (Terminal Id., Calif.), 27(4), Oct. 1941, pp. 234-249, figs. 64-68, 1 table.

Analytical report upon 824 returns from about 65,000 quail banded during the last 9 years. The average yearly returns were 2.04 percent. The longest period elapsing from banding to taking was 4 years 9 months and 10 days. More than half of the returns are from points within 2 miles of that of banding; the longest verifiable wandering was 31 miles. "Farms raised quail tend at times to move farther from their points of release than do wild-trapped birds, probably reflecting less ready adjustment. Liberations on refuges are effective in protecting most of the liberated birds if the liberations can be made a mile or more from the edges of the refuges. Only 5 per cent of the returns are from sources other than hunting." The causes of mortality in these cases are stated; cyanide fumigation of orange trees was the greatest. Suggestions are made as to future stocking and banding operations.

Management: Stream banks

Hass, Howard C. Sterile streams take on new life, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, p. 263.

Revegetation of stream banks, chiefly by merely protecting them from grazing, results in increase of both terrestrial and aquatic wildlife. In the La Crosse County (Wisconsin) Soil Conservation District, protection from grazing is a prerequisite to getting help from technicians or obtaining labor.

Management: Water supplies

Borell, A. E. Water for wildlife in the Southwest, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 258, 262.

Water is vital to wildlife in arid country. Stock-watering facilities at present are more often than not death traps for wildlife. Suggestions are given as to how they may be modified for safe use and enhanced value.

Management: Windbreaks

Fox, Adrian C. Windbreaks and their value to wildlife, North Dakota Outdoors (State Game & Fish Dept., Bismarck. 5 cents a copy), 4(9), March 1942, pp. 8-11, 10 photos, 1 cartoon.

Cultivating and grazing destroyed much of the original cover of the Northern Great Plains. To replace this in part for the benefit of wildlife and for numerous advantages to farms, farmers, crops, and livestock, it is desirable to make liberal use of windbreaks. Suggestions are given as to the kinds of plants to set out, and as to where and how to place them, in addition to notes on their value to wildlife.

Management: Windbreaks

Fox, Adrian C. Windbreaks and their value to wildlife, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 259-260, 1 photo.

Succinct statement of the value of windbreaks in erosion control, farm improvement, and wildlife utilization for cover and food.

Management: Windbreaks

Yeager, Lee E. Windbreaks and wildlife, in "Windbreaks" by J. E. Davis. Illinois Natural History Survey (Urbana), Circ. 38, 1942, p. 24.

Evergreen windbreaks are useful to wildlife from soon after planting throughout the life of the trees. Their valuesfor cover, as nesting sites, for locations for feeding stations, and in harboring insectivorous birds are briefly stated.

Management: Winter feeding

Anon. Winter feeding of wildlife, Timely Turf Topics (U. S. Golf Assoc. Green Section, Box 73, Benjamin Franklin Station, Washington, D.C.), Nov. 1941, p. 3 (Mimeographed).

"The bird population is being reduced faster than it is being replenished. x x x Most starvation is cumulative, the result of short rations over an extended period rather than for a few days only." Suggestions are made as to feeding ground and tree birds both by catering and planting. Food patches valuable to rabbits, squirrels, and other wildlife also are recommended.

Management: Winter feeding

Dittmar, John S. Protecting feeding shelters, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg, 10 cents a copy), 12(11), Feb. 1942, pp. 11, 24, 3 photos.

By fences that exclude deer but admit the desired species, especially the wild turkey.

Management: Winter feeding

McIntoer, James F., Jr. Feed game birds this winter, Virginia Wildlife (Blacksburg, Va. 10 cents a copy), 5(1), Fall-Winter 1941-42, pp. 15-18, 2 photos.

Leaving shocked corn or standing grain; planting food patches; making and servicing feeding stations; value of greens and mast.

Management: Winter feeding

Roberts, Thomas S. Feeding our winter birds, Conservation Volunteer (Minnesota Dept. of Conservation, St. Paul), 3(16), Jan. 1942, pp. 18-21, 2 figs.

Feeders and foods for small birds.

Management: Woodlots

Darbach, Charles A. Ten years of protection, Soil Conservation (Supt. of Documents, Washington, D. C. 10 cents a copy), 7(10), April 1942, pp. 252-253, 254, 256, 2 photos.

Fencing stock out of a woodlot improved soil texture and permitted natural tree reproduction. Herbaceous and shrubby undergrowth returned and the yield of maple products increased. The number of insectivorous birds became fourfold that in an adjoining unprotected woodland.

Natural History: Alaskan Wildlife

Dufresne, Frank. Mammals and birds of Alaska, U. S. Dept. of the Interior, Fish and Wildlife Service Circular 3, (Supt. of Documents, Washington, D. C. 10 cents a copy), 37 pp., 35 figs., 2 tables, 1942.

Popular account of the Territory and of its principal game and fur mammals and more interesting groups of birds. Introduction and protection are discussed and 14 distribution maps presented. The yearly average number (376,171) and value ($2,322,780) of land furs exported from Alaska over a 16-year period are tabulated.

Natural History: Birds of North Carolina

Wetmore, Alexander. Notes on the birds of North Carolina, U. S. National Museum (Washington, D. C.), Proc., Vol. 90, pp. 483-530.

Report upon a collection of bird skins (and some observations) made in 1939.

Natural History: Birds of Wisconsin

Barger, N. R., et al. Wisconsin birds, Wisconsin Society of Ornithology (Earl L. Loyster, Conservation Dept., State Office Bldg., Madison. 25 cents a copy), 32 pp. mostly tables (covers also functional), 1942.

Consists largely of charts showing the status and seasonal occurrence of 366 kinds of birds; each page of chart is faced by one with corresponding names and spaces for entering records. The publication includes definitions of the life zones of Wisconsin, a map depicting their approximate extent, and a 5-page bibliography.

Natural History: Great Basin

Tanner, Vasco M. A chapter on the natural history of the Great Basin, 1800 to 1855, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 1(2), Jan. 1940, pp. 33-61, 2 figs (one a photograph of the gull monument).

Referring to more than 50 historical sources, the writer discusses the discovery, character, and extent of the Great Basin. He gives thorough attention to the history of the buffalo in Utah and to the Mormon cricket--California gull episode. The plants and animals found in Utah by Federal government and other explorers are reviewed.

Natural History: Herpetology of Idaho

Tanner, Wilmer W. The reptiles and amphibians of Idaho, Great Basin Naturalist (Brigham Young University, Provo, Utah. 50 cents a copy), 2(2), June, 1941, pp. 87-97.

Annotated list of 12 species of amphibians and 26 of reptiles.

Natural History: Iowa

Harlan, James R. [Editor]. The Iowa game book of George E. Poyneer, Annals of Iowa (Iowa State Dept. of History and Archives, Des Moines. 25 cents a copy), 3rd Ser., 23(3), Jan. 1942, pp. 189-212, 1 pl. (portrait of the diarist).

Record of hunts and the game killed in Iowa and Illinois, 1874-77. The diary was begun in 1869 in New York but the earlier parts are not reproduced.

Natural History: Mammals, New Mexico

Blair, W. Frank. Annotated list of mammals of the Tularosa Basin, New Mexico, American Midland Naturalist (Notre Dame, Ind. $1.00 a copy), 26(1), July 1941, pp. 218-229.

Description of the area and of its ecological associations; annotated list of 43 forms of mammals; bibliography of 18 titles.

Natural History: Owls of New Jersey

Hausman, Leon A. The owls of New Jersey, N. J. Agr. Expt. Station (New Brunswick), 690, 36 pp., 21 figs., 1 table, May 1941.

Twelfth in a series of bulletins on the birds of New Jersey, this report contains a general discussion of the characteristics and habits of owls; gives a key to the (10) species, and an account of each in which food and economic importance are especially stressed.

Natural History: Salamanders of New York

Bishop, S. C. The salamanders of New York, N. Y. State Museum (Albany), Bul. 324, 365 pp., 66 figs., 1941.

Identification of all stages of 17 species; accounts of their life histories, habits, and distributions. Fourteen-page bibliography.

Propagation: Bob-White and chukar

Funk, E. M., James C. Hamilton, and H. L. Kempster. Game bird investigations. Quail and chukar partridges, University of Missouri College of Agriculture (Columbia), Bul. 435, 16 pp., 7 figs., 5 tables, Oct. 1941.

Authors' summary: "Experiments were conducted in 1938 and 1939 to study the effect of all-night light on egg production of quail and chukar partridges, and to study some factors affecting fertility and hatchability in these species. Egg production records were kept and egg measurements were made. Data were obtained to show factors affecting egg weight and clutch size. Feed consumption records were secured on the birds during the breeding season.

Propagation: Irradiation results

Stoelman, M. J., and J. A. Harper. Pheasant chicks in November, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 12(11), Feb. 1942, p. 13, 1 photo.

Review of literature (7 titles cited) on the effects of extra lighting on the reproductive activities of pheasants, and account of further experiments. "It is concluded that sexually mature pheasants may be activated to reproduce at any season of the year by using artificial illumination."

Propagation: Sexing pheasant chicks

Latham, Roger M. A simple method of sexing day-old ringneck pheasant chicks, Pennsylvania Game News (Pennsylvania Game Commission, Harrisburg. 10 cents a copy), 13(1), April 1942, pp. 6-7, 3 figs., 2 tables.

Based on the feather development in and around the eyefield; it can be practically applied with a minimum accuracy of 90 percent. Issued also as Research Circular No. 2 of the Commission.

Propagation: Vices, feather picking

Carey, F. P., and I. Seidel. Feather picking--a nutritional deficiency, Modern Game Breeding (J. A. Gardy Printing Co., 28 W. State St., Doylestown, Pa. 25 cents a copy), 12(3), March 1942, pp. 6, 13.

This vice is the result of a mineral deficiency in the diet and can be controlled by providing supplements of calcite flour, oystershell flour, or limestone grit and bonemeal.

Research: Analysis of productivity

Errington, Paul L. On the analysis of productivity in populations of higher vertebrates, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 165-181, 4 tables.

Author's abstract: "This paper was prepared to assist students of productivity in avian and mammalian populations to guard against errors arising from neglect of compensatory trends in reproduction and loss rates. Some degree of increased breeding as a result of losses of eggs or of young can be expected for a considerable variety of higher vertebrates, and an analysis of productivity of a hypothetical species (similar in behavior to the ring-necked pheasant, Phasianus colchicus torquatus) is outlined as an illustration of technique."

Research: Food supplements

Wing, Leonard. Nutrition experiment with wild Microtus populations, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(2), April 1942, pp. 182-183, 1 table.

The average weight of mice recovered from an area where food, including some of high nutritive value had been added, exceeded that of animals from a control plot.

Research: Marking, squirrels, Fox

Linduska, J. P. A new technique for marking fox squirrels, Journ. Wildlife Management (Logan J. Bennett, 1-A Horticulture Bldg., State College, Pa. 75 cents a copy), 6(1), Jan. 1942, pp. 93-94, 1 pl.

Fish fingerling tags applied to the outer toe of the hind foot.

U. S. Government: Fish and Wildlife Service

Anon. National defense and wildlife, U. S. Senate Special Comm. on the Conservation of Wildlife Resources. 77th Congress, 1st Session, Comm. Print No. 2, 10 pp., 1941.

The subject is treated under the following headings: Investment to guard, a contribution to national morale, benefits of wildlife conservation are long-time benefits, wildlife as a food resource, pest control conserves food, wildlife fact-finding and national defense, personnel for emergency duty, and conservation of human resources. Conclusions: "America has at present a huge investment in its resource of fish and wildlife. Great as the total investment is, however, it does not exceed the annual national income now derived from that resource. During the emergency this resource can be made to supply large quantities of food and other essentials from coastal and inland waters, and the normal take of game birds and mammals from areas of land that would otherwise be unproductive will be of special significance. The resource can be used to assist in training personnel for back-of-the-line and combat duties. It is a potent factor in maintaining morale. In this respect it may be of even greater value in the post-emergency rehabilitation program than during the time when the emergency exists. Finally, the right to use and enjoy this natural heritage, and to have it maintained for those purposes, is, in itself, an advantage among those others associated with our form of government and justifying its defense. Wildlife conditions in the United States are not yet what they should be everywhere. Those that are favorable are the result of years of planning and carrying out corrective measures that were sorely needed after unwise exploitation. The contributions that wildlife conservationists have made to the national welfare are small compared with what they can be, but programs for future accomplishments are under way and the prospects for their success, if continued, are encouraging."

U. S. Government: Fish and Wildlife Service

Gabrielson, Ira N. Fish and Wildlife Service, Ann. Rep. Secretary of the Interior, 1941, pp. 329-406, 2 pls., 9 tables.

This report places emphasis upon wildlife and the American way of living and on the work of the Service in relation to national defense. The annual report is the only publication giving a general account of the work of the Bureau and should be consulted by those desiring information on the research, regulatory, and control activities of the organization. Important sections relating to terrestrial wildlife are those on the ducks, geese, and other migratory birds, research on national forests and in the cooperative units, economic investigations, fur-animal conservation and restoration, disease research, national park wildlife, the national refuge program, Federal aid in wildlife restoration, predator and rodent control, and law enforcement.

Weights: Sheep, Dall's

Ulmer, Frederick A. On the weights of Dall's sheep, Journ. Mammalogy (Emmet T. Hooper, University of Michigan, Ann Arbor. $1.00 a copy), 22(4), Nov. 1941, pp. 448-449.

Four killed in Central Alaska ranged in weight from 173 to 185 pounds.

WILDLIFE LEAFLETS

Issues of interest to wildlife managers additional to those previously mentioned are listed below. Copies of these mimeographed leaflets can be obtained from the Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C.

201. Publications on attracting birds, 6 pp., September 1941.

References to official and unofficial pamphlets and books with the addresses of their publishers. Supersedes Leaflet BS-8.

204. Eelgrass depletion on the Pacific Coast and its effect upon black brant, by James Moffitt and Clarence Cottam, 26 pp., 1 table, November 1941.

Review of the history of disease on the Atlantic Coast and the effects of eelgrass shortage upon waterfowl. Status of the plant and the disease defined by regions of the Pacific Coast. Relation of eelgrass fluctuations to brant numbers and habits. Bibliography of 5 pages.

205. Raising mealworms, by Franklin M. May, 2 pp., November 1941.

Directions for raising these larvae commonly fed to captive animals; also addresses of 6 dealers in them.

207. Big-game inventory of the United States, 1940, 10 pp., 17 tables, January 1942.

Fourth in this series, this leaflet presents statistics as to the numbers of 15 groups of large animals, comparative notes on the series of inventories, and tabulations of the animals according to the ownership of the lands upon which they occur, as well as by States.

208. Publications on fur and fur animals, 5 pp., January 1942.

List of official documents, and references to unofficial books and periodicals, on this subject, with addresses from which they may be obtained. Supersedes Leaflet 3-1024.

210. Check-list of marsh and aquatic plants of the United States, by Neil Hotchkiss, 35 pp., January 1942.

Revision of Leaflet BS-72, 1936, sufficiently described by its title.

211. The Biological Surveys mammal collection, 4 pp., 1 pl., February 1942.

History of the collection; names of the principal collectors; number of types (1,331), and of all (138,130), specimens.

212. Care of buffaloes, 8 pp., February 1942.

Suggestions as to enclosures, forage and mineral requirements, methods of handling, growth and development, diseases and parasites, and the hybrid cattaloes. Bibliography of 16 titles.

217. War and wildlife, by M. E. Crouch, 4 pp., April 1942.

Summary of the effects upon conservation of World War I and suggested applications of the lessons under the present emergency.

NOTES AND NEWS

There is demand for information as to current wildlife research being conducted throughout the United States. In order to supply this, the U. S. Fish and Wildlife Service will endeavor to assemble and release annually a statement on the subject. It is therefore suggested that any interested person send before June 1, 1942, to the Fish and Wildlife Service, U. S. Department of the Interior, Washington, D. C., titles of research problems upon which he may be working, with the year of probable completion, and his name and address.

The Virginia Commission of Game and Inland Fisheries (Richmond) has prepared "A Wildlife Conservation Calendar" (September 1942-December 1943), the primary purpose of which is to aid farmers in keeping a record of fish and game taken. Each leaf bears a cartoon and brief text to inspire interest and serve as reminders.

Plymouth Teachers College (Plymouth, N. H.) will organize for the summer session (July 6-August 14) a Conservation Education Workshop in which basic principles and practical aspects of conservation curricula and of the conservation of natural resources will be taken up. The leader will be Dr. Richard Weaver of Dartmouth College.

Suspension of the magazine Conservation (American Forestry Association, 919--17th St., N. W., Washington, D. C.) for the duration of the war has been announced.

The discussion of controlled burning is continued in the Journal of Forestry (Mills Bldg., Washington, D. C., 50 cents a copy), 40(4), April 1942, pp. 357-359, by a John Doe letter. The writer states that the farmers and cattlemen of the Southeast know more about the use of fire than some people give them credit for, and points out the advantages of burning to these groups, to game managers, and to turpentine operators. He asserts that money spent on fire prevention in the Southeastern Coastal Plain is wasted.

Biology as a high school subject has suffered a slight but definite loss of ground during the past ten years, states Dr. Oscar Riddle of the Carnegie Institution of Washington, D. C. Dr. Riddle bases his conclusion on the study made by a committee under his chairmanship of something over 3,000 replies to a questionnaire circulated to nearly 16,000 teachers in secondary schools throughout the country.

There have been gains in some schools, losses in others, with the losses exceeding the gains over the country as a whole. In about 10% of our schools, the biology course has been dropped to make way for one in the social sciences.

A definite tendency on the part of teachers and curriculum planners to avoid difficulties with group prejudices by omitting or "playing down" controversial subjects was noted by Dr. Riddle. About 14% of the public schools, and even more of the parochial high schools, do not discuss the subject of inborn inequalities in human beings; and a full half of all schools from which replies were received avoid the teaching of evolution as a part of their biology course.

"Data concerning biology clubs suggest that biology teaching in all community types and regions is often effective in stimulating the interest of

pupils," Dr. Riddle states. "A consideration of the topics which teachers would emphasize leads to the conclusion that, though many biology teachers teach soundly and effectively, there is a widespread tendency to teach biology not as a science but (a) as a way to pleasing hobbies, or (b) as a series of practical technologies." (Science News Letter, April 25, 1942, p. 264.)

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